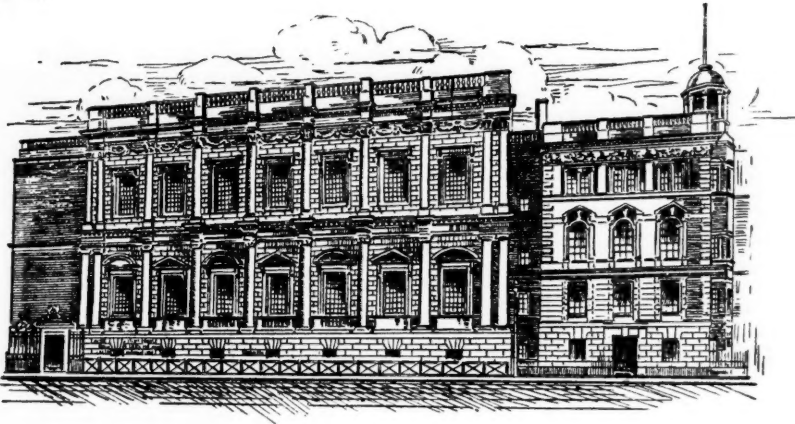


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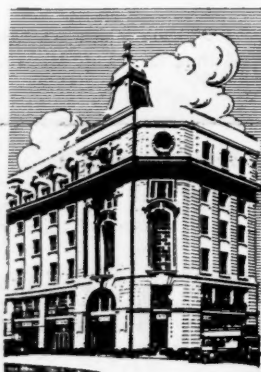
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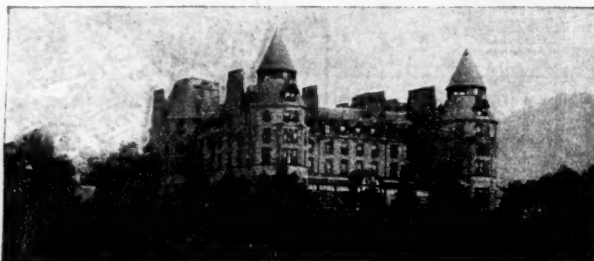
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| 1876. Lieutenant J. F. G. Ross of
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| 1882. No Medal awarded. | 1909. No Medal awarded. |
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amptonshire Regiment. | 1911. Captain H. T. Russell, late
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| 1898. Captain W. B. Brown, R.E. | |
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SECRETARY'S NOTES

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At the Annual General Meeting, held in the Theatre of the Institution on 1st March, the following were unanimously re-elected as Members of the Council:—

Admiral Sir H. H. Bruce, K.C.B., M.V.O.,
General Sir P. W. Chetwode, Bart., K.C.B., K.C.M.G., D.S.O.,
Lieutenant-General H. D. Farquharson, C.M.G.,
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Colonel The Duke of Northumberland, K.G., C.B.E., M.V.O.,
Colonel C. W. Trotter, C.B., T.D.

Chairmen of the Council.

Admiral Sir Henry H. Bruce, K.C.B., M.V.O., has been elected Chairman of the Council for 1927-28.

Field Marshal the Viscount Allenby, G.C.B., G.C.M.G., has been elected Vice-Chairman for 1927-28.

Council Committees.

The Committees of the Council are now composed as follows:—

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Staff.

Captain E. Altham, C.B., R.N., has been appointed by the Council, as from 1st May, 1927, to fill the vacancy caused by the retirement of Lieutenant-Colonel Sir Arthur Leetham, Knt., K.C.V.O., C.M.G. Captain Altham now combines the offices of Secretary and Chief Executive Officer with his former appointment of Editor of the JOURNAL.

Lieutenant-Colonel Sir Arthur Leetham, Knt., K.C.V.O., C.M.G., will continue as Honorary Curator of the Museum for the present.

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 Second-Lieutenant L. P. Williams, Royal Artillery (T.A.).
 Colonel H. E. R. R. Braine, C.M.G., D.S.O., Royal Scots Fusiliers.
 Instructor Lieutenant-Commander A. F. Booth, M.A., R.N.
 Captain H. Lumsden, M.C., 12th Royal Lancers.
 Captain R. E. Le Fleming, M.C., Indian Army.
 Captain J. C. Martin, M.C., Indian Army.
 Major J. P. Gulland, Indian Army.
 Commander A. L. Fletcher, R.N.
 Captain A. P. Q. Thomson, Indian Army.
 Second-Lieutenant S. Vickers, Royal Fusiliers.
 Second-Lieutenant S. R. Garratt, Lancashire Fusiliers.
 Colonel G. M. Orr, C.B.E., D.S.O., late Indian Army.
 Lieutenant P. G. Bower, King's Royal Rifle Corps.
 Lieutenant-Colonel R. M. Raynsford, D.S.O., Territorial Army Association.
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 Captain C. H. M. Peto, 9th Royal Lancers.
 Lieutenant-Commander V. C. Dorman-Smith, R.N.
 Captain F. E. Laughton, Indian Army.
 Major G. W. Cox, late 4th Bn. The Black Watch (T.A.).
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 Lieutenant C. A. S. Nichols, R.N.
 Lieutenant H. Read, Royal Artillery.
 Flight-Lieutenant J. W. Turton Jones, Royal Air Force.
 Midshipman J. Bowman-Manifold, R.N.
 Captain D. W. Reid, D.S.O., M.C., Indian Army.
 Major A. Stirling, Argyll and Sutherland Highlanders.
 Major E. A. C. Fazan, M.C., T.D., The Royal Sussex Regiment (T.A.).
 Lieutenant I. R. Baird, M.C., The Royal Berkshire Regiment.
 Captain R. W. Cave-Orme, The Lincolnshire Regiment.
 Captain T. R. Hurst, Indian Army.
 Captain C. E. W. Birkett, M.C., King's Royal Rifle Corps.
 Major E. C. Mockler, Indian Army.
 Captain J. M. L. Grover, M.C., King's Shropshire Light Infantry.
 Paymaster Lieutenant-Commander G. E. L. Hargreaves, R.N.

Gold Medal Essay—Result, 1926.

The report of the Referees appointed to adjudicate on the Gold Medal Essay for 1926 will be found at the end of this JOURNAL in the "Proceedings at the Anniversary Meeting" (page 477).

No essay was considered to be of a sufficiently high standard to merit the award of the Gold Medal, but the Trench Gascoigne prizes of thirty and twenty guineas have been awarded to Lieutenant-Colonel J. C. Dundas, D.S.O., Royal Tank Corps, and Wing-Commander C. H. K. Edmonds, D.S.O., O.B.E., Royal Air Force, respectively, for the two best essays of the year.

Museum Notes.

ADDITIONS.

- (7927) Officer's Dress Coatee of the 22nd Foot, of the period of 1820, formerly belonging to the late Colonel James Craster.—Given by Miss Craster.
 (7928) Officer's Dress Coatee of the 28th Foot, of the period of 1854, formerly belonging to the late Lieut.-Colonel J. T. Craster, and worn by him in the Crimean War and Indian Mutiny.—Given by Miss Craster.
 (7929) An Aquatint by F. Mawman, dated January 1st, 1821, of "White Hall," which depicts the Banqueting House previous to the removal of the Holbein Gate (1758).—Given by Philip S. Waley, Esq.

- (7930) A German (Machine) Revolver, .32 calibre, picked up after an unsuccessful attack made on the Canadians (date unknown).—Given by Captain A. W. Lawrence.
- (7931) Queen Victoria's South African Medal with clasps for Rhodesia and the Relief of Mafeking, awarded to Lieutenant H. Wallis, British South African Mounted Police.—Bequeathed by the late Mr. Francis Wallis.
- (7932) Two Medals which belonged to Captain Samuel Wallis, 45th and 69th Foot, viz.: (1) Naval General Service with clasp for Copenhagen, 1801; (2) First India General Service with clasp for Ava.—Bequeathed by the late Mr. Francis Wallis.
- (7933) Infantry Officer's Sword with brass handle, of the period of King George IV.—Bequeathed by the late Mr. Francis Wallis.
- (7934) Two Armour Back-pieces of the period of King William III.—Given by Major H. G. Parkyn, O.B.E., F.S.A.
- (7935) Officer's Scarlet Tunic of the 26th Cameronians (1881)—Given by Colonel A. V. Ussher, C.M.G.
- (7936) A Mezzotint Engraving of the picture painted by Frank O. Salisbury, "The Burial of the Unknown Warrior in Westminster Abbey, 11th November, 1920."—Given by General A. F. Gatliff, D.L., J.P., Royal Marines (retired).
- (7937) The following Uniform of the Royal Indian Marines: Full dress coat, dress trousers, gold laced belt and pair of epaulettes, and gold and blue sword knot.—Given by Mrs. Cecil Ford.

PURCHASE FUND.

This Fund was opened with the object of purchasing suitable exhibits, which from time to time are offered to the Museum, or are put up for sale at various auctions. The Council hope it will receive support from Members of the Institution who are interested in the Museum.

ATTENDANCE

The amount taken for admission to the Museum during the past quarter was:—

£ 61 19s. 0d. in February.

£ 58 15s. 0d. in March.

£103 16s. 6d. in April.

Journal Notes.

COPIES OF FRONTISPICES.

A limited number of copies of the coloured frontispieces, "Louisbourg," "Orthes" and "The Taking of Buenos Ayres," published in the JOURNALS of August and November, 1926, and February, 1927, are available for sale to Members. They can be supplied, post free, for 1s. 6d. each; 2s. 6d. a pair; or 3s. 0d. the set of three.

PRICE OF JOURNAL TO NON-MEMBERS.

The price of the Journal to Non-Members, as from the February, 1927, number, is 7s. 6d., or the four quarterly numbers will be sent for an annual subscription of £1 10s. 0d., post free in either case.

TRADE DISCOUNT.

Recognised firms can now be supplied with not less than one dozen copies of the JOURNAL at a time, at a wholesale price of 7s. od. each copy, the buyer to collect them from the Institution.

ADDITIONAL COPIES OF THE JOURNAL.

Additional copies of early numbers of the Journal, if available, can be supplied, post free, to Members at:—

3s. od. for Journals prior to February, 1927.

4s. od. for the Journal of February, 1927, and later.

Library Notes.

FACILITIES FOR BORROWING BOOKS.

The special attention of those Members who are now paying the new annual subscription of £1 5s. od., is invited to the fact that they are thereby entitled to the full privileges of the lending Library without further charge. These include the right to have sent to them not more than four volumes at a time on loan, the Member paying postage both ways.

Old Members who have not wished to conform to the new arrangement and who are still paying the original subscription of £1 rs. od., must pay an additional subscription of 10s. per annum in order to belong to the Lending Library.

All Members are, of course, free to use the Library when they visit the Institution.

The subject of naval warfare is far more concerned with reading aright the lessons of the Battle of Jutland than with struggling over what should or should not have been done on that occasion. Some of these lessons are connected with technical and tactical matters which are rightly regarded as confidential, but others are of general interest and deserve wider publicity and discussion than they have hitherto received.

For convenience they may be dealt with under the following headings:—

- (1) The importance of battle.
- (2) The system of command in battle and opportunities for independent action.
- (3) Examination of the types of ships at Jutland and at the present day, and the effect of developments in ship construction on tactics.
- (4) Effect of a reduction in the number of ships (owing to the Washington Agreement) on tactics.
- (5) The proper use of light and searchlights by day and by night.
- (6) Staff work before, during, and after a fleet action; communications and intelligence.

SECRETARY'S REPORT

As regards the Journal, the following is the position: The Journal is published quarterly, and is sent to all Members of the Society. It is also sent to all those who have paid for an annual subscription. The price of the Journal is 1s. 6d. per annum, in advance. The price of a single copy is 4s. 6d.

The Journal is published by the Secretary, who is responsible for its contents. It is also responsible for the distribution of the Journal to all those who are entitled to receive it. The Journal is published in the month of January, and is sent to all Members of the Society by the first of February.

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FINANCIAL STATEMENT

The following is a statement of the financial position of the Society at the end of the year 1917. The total income of the Society was £1,200, and the total expenditure was £1,100. The balance carried forward to the year 1918 was £100.

AGREEMENTS

The following are the agreements entered into by the Society during the year 1917. The first agreement was entered into on the 1st of January, and the second agreement was entered into on the 1st of February.

General Notes

Notes on the Financial Statement

A balance sheet is published at the end of each year, showing the financial position of the Society. It is also published in the Journal, and is sent to all Members of the Society. The balance sheet is published in the month of January, and is sent to all Members of the Society by the first of February.

Notes on the Journal

The price of the Journal is 1s. 6d. per annum, in advance. The price of a single copy is 4s. 6d. The Journal is published by the Secretary, who is responsible for its contents. It is also responsible for the distribution of the Journal to all those who are entitled to receive it.

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[Authors alone are responsible for the contents of their respective Papers.
All communications (except those for perusal by the Editor only)
should be addressed to the Secretary, Royal United Service Institution.]

THE LESSONS OF JUTLAND.

By REAR-ADMIRAL J. E. T. HARPER, C.B., M.V.O.

THE student of naval warfare is far more concerned with reading aright the lessons of the Battle of Jutland than with wrangling over what should or should not have been done on that occasion. Some of these lessons are connected with technical and tactical matters which are rightly regarded as confidential, but others are of general interest and deserve wider publicity and discussion than they have hitherto received.

For convenience they may be dealt with under the following headings:—

- (1) The importance of battle ;
- (2) The system of command in battle and opportunities for independent action ;
- (3) Comparison of the types of ships at Jutland and at the present day ; and the effect of developments in ship construction on tactics ;
- (4) Effect of a reduced battle-line (owing to the Washington Agreement) on tactics ;
- (5) The proper use of light craft by day and by night ;
- (6) Staff work before, during and after a fleet action ; communications and intelligence.

(1) THE IMPORTANCE OF BATTLE.

Those who argue that the Navy's primary object in war should be the destruction of the enemy's fleet are wont to exaggerate the importance of battle because they have confused the *object* with the *objective*.

The main *object* of the Navy in war is to secure our sea-borne transport and to deny free passage to that of the enemy. When this object has been attained it can truly be said that we have "command of the sea," a phrase which, incidentally, is meaningless except in war. A first essential to the attainment of this object is that our main fleet should defeat or contain that of the enemy, but this, alone, will not make the seas safe for our shipping. Even if the enemy's main fleet were completely annihilated, it would still be necessary to police the sea routes.

Throughout the late war the Grand Fleet successfully contained the German High Sea Fleet and thereby materially assisted the Navy as a whole in achieving its object—the safety of our sea communications. It is true that sorties were made by the enemy but on no occasion was his main fleet able to keep at sea long enough to inflict any serious damage on our shipping. In fact, the High Sea Fleet was more successfully "contained" than was the French Fleet at Toulon when watched by Nelson. It should be noted that the French fleet was not "blockaded," nor was the High Sea Fleet. In both cases the object of the British fleet was to bring the enemy to action if he put to sea and not to blockade him in harbour.

Opportunity to force a weaker enemy fleet to sea, and to bring it to action under conditions which will admit of defeating it completely, seldom rests with the superior one. An annihilating victory was denied the British Fleet at Jutland, because the situation was ruled by the weather. To press forward into battle regardless of conditions is the negation of sound strategy. The wise commander with time on his side seeks by tactical manœuvre to improve the conditions under which he engages. If, however, they continue such as to neutralise any advantage he may have in numbers or as to make the issue purely a matter of chance, he will refuse to be drawn into battle through fear of any odium which may attach to him afterwards. A commander who rushes recklessly into battle, at a time when his defeat would mean disaster to his country's cause and when victory would have a dubious effect on the main issues at stake, is one who loses sight of his *object*.

Battle should be regarded as a means to an end, not a haphazard opportunity for "having a go" at an adversary in the hope of an ephemeral material victory which will receive popular acclamation. The tangible results of a material victory would, of course, appeal to the popular mind, while the psychological effects on both victor and vanquished cannot be ignored. On the other hand, what is termed a moral victory may, none the less, lead to the attainment of the main object.

Victory does not always go to him who does most material damage, but it does go to him who makes his opponent feel defeat to the extent of not wishing again to try conclusions in battle.

Battle, in short, should be a business dictated by sound strategy and not a "stunt," committed on heroic impulse. It was this policy which governed the conduct of the main action in Jutland and the first lesson to be learned from that battle is that although such a policy may not lead to a dramatic triumph at the moment, it goes far to ensure that the war will be won in the end and not lost in an afternoon.

(2) THE SYSTEM OF COMMAND IN BATTLE AND OPPORTUNITIES FOR INDEPENDENT ACTION.

It has often been alleged that the system of command at Jutland was unduly rigid and centralised, that control was centred entirely in the Fleet Flagship and that initiative was denied to commanders of squadrons and flotillas. Apart from the fact that this is not correct, such criticism ignores the necessity for co-ordinating the movements of the squadrons and units of a big fleet, especially under the conditions of low visibility which so frequently prevail in the North Sea. The degree of decentralisation and freedom to take independent action accorded to subordinate commanders are, however, matters open to discussion.

Some degree of independence must, of course, be permitted at all times, but it will have to be more restricted in low visibility than it need be in clear weather. By way of comparison it may be noted that the tactics of the High Sea Fleet at Jutland indicate that control was very rigidly centred in the German Fleet Flagship. This may be generally desirable in the case of the weaker fleet; at any rate, it appears certain that the avoiding tactics so efficiently carried out by the enemy battle fleet on that occasion would not have been so successful if the system of command had not been centralised.

In dealing with the system of command it is desirable at the outset to consider what is the most suitable position in the fleet for the C.-in-C. to occupy in order to exercise that command. It has been advocated that the C.-in-C. should not be in the line of battle, but that he should be in a fast vessel capable of rushing him to any point of the battle on the same principle that the Headquarters of an army should not be in the trenches but in a selected position behind the lines.

Whatever the arguments in favour of the C.-in-C. being away from the battle line, they carry less weight as battle fleets become smaller and fleets become more mobile. If the C.-in-C. is not to be in the battle line there would seem to be only one other alternative—that is, that he should be in the air. This is perhaps a forecast of the future, and cannot be seriously considered until aircraft become more reliable and less

vulnerable than they are now. As always, too, the weather conditions must be borne in mind.

At Jutland it is possible that the C-in-C. would have had a far better idea of the situation if, instead of being dependent on reports from his cruisers and his own limited range of visibility, he had been in the air; but it is quite certain that the difficulties in communication and staff work involved would have made it quite impracticable for him to have conducted the battle from an aeroplane at that time. The conclusion to be drawn seems to be that in future a thoroughly trustworthy staff officer—possibly the Chief of Staff himself—should be in the air, but that, for the present, the C-in-C. should remain in the battle line.

Incidentally it seems not improbable that we shall see a parallel to this in the new Army. The reduction of the infantry arm and development of tanks and aircraft point to greatly increased mobility in land warfare. The result may be that headquarters can no longer remain stationary. The General directing the tactics of an army in battle may, it is suggested, find himself in a tank or an aeroplane.

In studying Jutland with a view to determining the degree of freedom to be accorded to subordinate commands, it is necessary to bear in mind that in the battle fleet, the four "Queen Elizabeths" alone had marked superiority in speed. The rest had a maximum speed in company of about 20 knots. Furthermore, it may be taken for granted that unless the speed of one of the rival battle fleets has been reduced by damage, a fleet action will usually be fought at something approaching full speed, for the commanders on each side will be straining to improve their tactical position, or one will be endeavouring to escape and the other to head him off. Clearly, therefore, the principle that it is unsound to detach any part of the fleet which has not sufficient margin of speed to rejoin the main body, applies just as much to-day as it did then.

This does not preclude limited manœuvring by divisions with the object of improving gun-fire or avoiding torpedoes, but such manœuvres must not embarrass the C-in-C. by throwing out the handling of the battle fleet as a whole. At Jutland the "Queen Elizabeths" with a squadron speed of about 24 knots and the battle cruisers with one of 25 to 27 knots were in a different category. These commands could safely select their own range and were in no danger of being isolated by a superior enemy force; they were well placed at each end of our battle line for independent action on the van or rear of the enemy. In practice the battle cruisers had more opportunity for exercising their freedom than the 5th Battle Squadron because action with the enemy battle fleet was joined on each occasion on a converging course, which gave our battle cruisers, at the head of the line, a better chance to encircle the enemy, while the rear of each of the opposing battle fleets was more widely separated from that of their opponents. Had the 5th Battle Squadron pushed forward to the head of the line it would have blanketed

the fire of the other battleships and the C.-in-C. would not have been as well prepared for fighting on an opposite course as he was through having a fast, strong division at *each* end of his battle line. This is an ideal disposition as it affords opportunity for bringing pressure to bear on the extremities of the enemy's line no matter in which direction the battle is fought. As things turned out at Jutland, it is probable that there would have been more scope for this fast battle squadron if, during the main action, it had been in company with the battle cruisers at the head of the line, but the special conditions could not be foreseen.

In the near future our combined battle fleets will consist of:—

Maximum designed speed, squadron speed, in knots.

2 Nelsons	23	20
5 Royal Sovereigns	23	20
4 Iron Dukes	21	21
5 Queen Elizabeths	25	24
and our battle cruiser force to-day is:—		
1 Hood	31	29
2 Renowns	31.5	29
1 Tiger	30	29

Except that the number of ships in the battle fleet will be much less than at Jutland, the composition of the main fleet as regards fast divisions is not dissimilar and, in a broad sense, the experience of that battle should hold good. The "Queen Elizabeths" and battle cruisers will doubtless be able to exercise considerable freedom of movement, particularly if visibility is good, but, even so, fast squadrons must conform to the C.-in-C.'s general tactical intentions and in low visibility, or at night, it is vital that they should not lose touch so completely as to risk falling out of a main action or of suddenly running foul of, or blanketing, their consorts.

Cruisers have their own special rôle, and must at all times be given very considerable latitude, as they were at Jutland, to enable them to fulfil it most efficiently.

(3) COMPARISON OF THE TYPES OF SHIPS AT JUTLAND AND AT THE PRESENT DAY, AND THE EFFECT OF DEVELOPMENTS IN CONSTRUCTION ON TACTICS.

It is an accepted axiom that the power of an enemy should never be under-rated and that nothing should be left to chance. Most commanders therefore will be disposed to assemble all available force preparatory to going into action, but Jutland produces examples of the undesirability of including in a fleet ships of an unsuitable type. Numbers may easily be added, but the fleet may thereby be weakened in fighting power, moreover, a multiplicity of types of ships is likely to prove embarrassing.

BATTLESHIPS.—Our battle fleet to-day is not very homogeneous; we have the two "Nelsons" and five "Royal Sovereigns," with a designed speed of 23 knots, and the four "Iron Dukes" with one of 21 knots. The greatest difference is, however, in regard to the gun range and the vulnerability of the ships, more especially to under-water attack. The difference between the guns of the "Iron Dukes" and the guns of the "Nelsons" is greater than that between those of the oldest and newest ships in the battle line at Jutland. The difference in speed is comparatively less marked.

—The increased protection against under-water attack enables the most modern battleships to accept greater risks than would have been justifiable with the older ships. Whereas with battleships of pre-Jutland design it was very desirable to deploy into line of battle before reaching the extreme torpedo range of the capital ships of the enemy, with post-Jutland ships this is not so vitally important. The present day torpedoes have a longer effective range than those in use at Jutland, but owing to the greater range of the guns of the main armament it would still be possible and desirable, provided the weather is clear, to establish hitting from the more modern ships while still outside effective torpedo range. This would, however, very possibly, result in having to dispense with the gunfire of the four "Iron Dukes" until the range is closed sufficiently for their older guns to become effective.

At present this disparity between the old and the new may not seem very marked but the time may come when the "Iron Dukes" will be in a similar position to that of the "Deutschland" class at Jutland, except that the deficiency in speed will not be so marked. Scheer did not originally intend to include the 2nd Squadron of pre-dreadnoughts in his operations, but at the urgent request of Admiral Mauve, who commanded that squadron, he decided to allow them to accompany the fleet. Their presence must have caused the German C-in-C. anxiety throughout the action. They limited the speed of his fleet and were of practically no assistance to him. If matters had worked out somewhat differently to what they did, it is conceivable that the presence of the 2nd Squadron would have prevented Scheer reaching his protected waters before being brought to action after daylight.

CRUISERS.—It was fortunate that naval opinion had realised to some extent, before the war, that a multiplicity of types of ships would prove to be a hindrance in battle. By the time Jutland was fought the old protected cruisers and scouts had been banished from the main fleet and were usefully employed on operations outside the North Sea. We still had, however, one type of ship—the armoured cruiser—which proved quite useless as a unit of the main fleet. These ships did not figure in the actions of Heligoland and Dogger Bank, and if there had been a sufficiency of light cruisers they would not, presumably, have been attached to the Grand Fleet at Jutland. They had insufficient

gun-power to be given a position in the battle line and insufficient speed to act with the battle cruisers. As part of an advanced screen to the battle fleet their lack of speed prevented them extending the distance rapidly when required to do so. Of the two squadrons of armoured cruisers present one took no part in the action and the other was almost totally annihilated. As matters turned out it would have been better if they had remained in harbour. Their presence was an embarrassment rather than a help, and did little but swell the losses of ships and personnel.

This experience emphasises the point that the mere adding to numbers by including vessels of unsuitable type is unsound.

There was an insufficiency of light cruisers at Jutland and it seems probable that there will be a similar shortage in future; but in this connection the lesson to be learnt is that, if, during the approach, the fleet is divided, as the battle fleet and battle cruiser fleet were, it is better for the light cruisers to be allocated more equally. Our battle fleet gained nothing by having a screen of armoured cruisers, but earlier visual contact would have been ensured if another light cruiser squadron, instead of being attached to the battle cruiser fleet, had been acting as an advanced screen to the battle fleet.

At the present day we have, to all intents, only two classes of cruisers—the 10,000 ton and the quondam light cruiser. There is no reason to be afraid that in the heavy 10,000 ton cruiser we are repeating the mistake of the armoured cruiser. The crux of the whole question is speed. In a fleet action the 10,000 ton cruisers will prove of considerable value as a strong support to the lighter cruisers in the advanced screen and the considerable margin of speed which they possess will enable them to support their consorts without delay.

The other important developments in ship construction which will affect future tactics are submarines which will have sufficient speed and endurance to accompany the main fleet; the extra size of the destroyers which will enable them to maintain a higher speed in heavy weather; and the introduction of large and fast aircraft carriers.¹

We can draw no lessons from Jutland in regard to the use of aircraft for reconnaissance purposes; but it seems unlikely that they will entirely take the place of the cruiser for this purpose, owing to the peculiar and uncertain limitations imposed by atmospheric conditions and the frailty of the aircraft themselves.

¹ An article on "Aircraft Carriers in a Fleet Action," by Lieutenant A. W. Clarke, R.N., appeared in the JOURNAL for August, 1926.—EDITOR.

(4) EFFECT OF A REDUCED BATTLE-LINE (OWING TO THE WASHINGTON AGREEMENT) ON TACTICS.

At Jutland, when the main action had been joined, there were twenty-seven battleships in the British line, including the three "Queen Elizabeths,"¹ and twenty-two in the German line. With ships closed up in station at two and a half cables interval, this meant that our battle line would have been approximately six miles long, while the German one was very little less. Actually very long lines like these are wont to get strung out somewhat and the distance from van to rear was probably often as much as seven miles. To-day, however, the Washington Agreement has limited our line to a maximum of sixteen battleships, of which five are the fast "Queen Elizabeths"; the total length of this line with ships at two and half cables intervals, therefore is just under three and a half miles.

At present the command and organization of our battle squadrons is somewhat in a state of flux, but it would seem logical and appropriate that eventually the Commander-in-Chief should fly his flag in the "Nelson," and that the fleet flagship and her sister ship, the "Rodney," should take their place together in the battle line between the five "Royal Sovereigns" and four "Iron Dukes," the "Queen Elizabeths" providing a fast squadron at one end and the battle cruisers at the other. The net result of this would be a fleet consisting of a comparatively short and compact main squadron of eleven battleships with powerful and highly mobile squadrons at its extremities.

At Jutland the great length of the line and the number of ships in it without any superiority of speed over that of the battlefleet as a whole, made it most difficult to develop the full gun-power of all the units, in fact it was only during Jellicoe's L-shaped deployment and later, when Scheer tilted fair into the centre of our battle line, that it was, even theoretically, possible for the whole weight of our battleships' fire to be developed; in practice limitations of visibility neutralised even these opportunities in varying degrees.

As has been remarked before, it is impracticable for sections of the battle fleet, which do not possess a reserve of speed, to engage in independent manœuvres, and it seems probable, therefore, that the "Nelsons," "Royal Sovereigns" and "Iron Dukes" will, generally speaking, manœuvre as one squadron. At Jutland, it was more than once found convenient to alter the course of the battle fleet by divisions or sub-divisions, because a simultaneous turn by all ships out of line ahead would have brought the fleet into a very long and awkward single quarter-line, making station-keeping difficult and, probably, leading to some disorder and masking of gun-fire. On the other hand, there is no

¹ The "Queen Elizabeth" herself was not present at Jutland, and the "Warspite" fell out of the action while the battle fleet was deploying.

doubt that the German battle fleet had drilled at simultaneous turns until it could perform them with great precision, although they only made use of such manœuvres to avoid action. It seems reasonable to assume that, under present day conditions, "turn together" will be the order, rather than "turn, leaders of divisions (or sub-divisions) together, the rest in succession."

This question of a reduced battle line can, of course, be discussed from many points of view. Broadly its effect must be to make the battle fleet far more mobile; manœuvres to close the enemy, such as that signalled by Jellicoe while the fleet was still deploying, but which he had to cancel because it was impracticable, will present little or no difficulty; the bearing of ships in line can be changed comparatively rapidly, whereas, with the twenty-seven ships at Jutland it would have been a lengthy process; manœuvres to avoid torpedoes will be easier to perform; and the shorter battle line will present a smaller target for enemy torpedo craft "browning the covey," and less choice of target for individual attacks.

It is not inconceivable that an international agreement may be come to which will preclude the building, in peace-time, of warships, other than aircraft carriers, of more than 10,000 tons and carrying guns bigger than 8-inch. This would merely result in the 10,000 ton "cruiser" having to assume the rôle of battleship. It might also lead to a type of 10,000 ton ship where a certain amount of speed had been sacrificed in favour of more guns and more armour so that she could "lie in the line"; if this comes about we shall merely be reverting to the conditions of a main force of slower but more powerful ships with faster and lighter wing squadrons, although the individual units will be smaller. The fact that the guns may be only half the calibre of those of our latest battleships does not mean that battle will, necessarily, be joined or fought at less range, for the range of the modern 8-inch gun will be fully up to the opportunities afforded by visibility. In practice it is this latter which will continue to govern, to a very large extent, the tactics to be employed in battle. Spotting and the direction of gunfire, even the manœuvring of fleets themselves, may be conducted from the air, but aircraft, too, suffer from limitations imposed by weather and light; moreover, in spite of improvements to gunnery appliances, we are some way off attaining such perfection that a highly mobile enemy can be effectively engaged although none of his ships is visible. What is possible for static artillery on shore, bombarding fixed objectives, is a very different problem where both gun platform and target are moving at high speed.

5. USE OF LIGHT CRAFT.

BY DAY.—In the light of the knowledge we gained after the action there can be little doubt that our light craft could have assumed a more

offensive rôle than they did during the daylight phases at Jutland : but it is easy enough now to say that no submarines were present on either side, and therefore destroyers need not have been tied to the battleships and battle cruisers to act as a screen. At the time, submarines seemed a very real menace as is seen by the repeated reports from ships which imagined they had sighted them.

Whether the menace of under-water craft can be ignored altogether in future, must depend partly on the development of these vessels and their future capability to remain in company with the fleet, and largely on the locality in which an action is being fought. At the date of Jutland submarines were quite incapable of keeping up with the fleet, but the fact that battle was joined within measurable distance of the enemy submarine bases, very naturally put everyone in our fleet on the alert. Broadly speaking, however, the lessons, not only of Jutland but of the late war generally, are that a mass of surface ships moving in company at high speed and in open waters have nothing much to fear from the submarine and the development of the devices for locating under-water craft at some distance will reduce the risk still more. Conditions in a fleet action are wholly different to those of ships on passage and in waters where a submarine may lie in wait for her opportunity. In a fleet action, unless an enemy succeeds in enticing our ships over a carefully prepared submarine trap, it will be most difficult for under-water craft to work their way into a position to attack and for this reason it would seem at first sight that in future it will be possible to release our destroyers for more active duties.

Unfortunately, a new danger has arisen in the shape of torpedo-carrying aeroplanes, and until the whole system of fleet anti-aircraft defence has been fully developed and tried out, this menace may call for a destroyer or light cruiser screen to reinforce the protective measures which the battleships can take for themselves.

Aircraft can, of course, attack from almost any bearing, whereas a submarine is, generally speaking, only dangerous on a forward bearing. This means that an anti-aircraft screen must be stationed almost the whole length of the battle line instead of in the form of flotillas grouped near the extremities.

Another call on the services of destroyers, and possibly of cruisers too, will be for the protection of our own aircraft carriers. These great, highly vulnerable ships are tempting targets for enemy light craft and aeroplanes, especially as they will often have to manœuvre at some distance from the battle fleet. It is clear, therefore, that although Jutland demonstrated the desirability for making the maximum use of our light craft for offensive purposes, new claims on their services in a defensive capacity have arisen and cannot be completely ignored.

By day there are three forms of offensive action open to destroyers :

- (a) Against the enemy battle line ;
- (b) Against the enemy destroyers ;
- (c) Against the enemy aircraft carriers.

The first would seem more applicable to the tactics of the weaker fleet, whose object must always be to reduce the disparity in force by a process of attrition ; moreover, destroyer attacks are certain to continue to play an important part in the tactics of an enemy desirous of avoiding action. On the other hand an ill-judged offensive by its own destroyers *en masse* may seriously interfere with gun-fire and, for the time being, neutralise the advantages of the stronger fleet.

Counter action against enemy destroyers, on the principle that a vigorous offence is the best defence, is, of course, generally desirable and would doubtless have been carried into effect by our light craft at Jutland even more than it was, but for the seriousness with which the submarine menace was regarded.

The location of the enemy's aircraft carriers will be one of the primary duties of our reconnaissance aircraft. Once this has been done, they will become important objectives for attacks by our light craft and torpedo aeroplanes.

BY NIGHT.—It is not very generally realized that our light cruisers and destroyers during the night after Jutland did far more than simply trail tamely behind the battle fleet. It is not improbable that as things turned out, Admiral Jellicoe's decision to mass his light craft astern enabled them to inflict more damage on the enemy than they would have done had he launched them into the night to hunt for the High Sea Fleet. Certainly it minimised the chances, which in the latter alternative would have been considerable, of "regrettable incidents" with each other or with our own heavy ships.

During the hours of darkness, our light craft caused the enemy heavier losses than he sustained in the whole of the rest of the battle. These losses included one battleship, two light cruisers and two destroyers sunk by our torpedoes and a third light cruiser rammed and sunk by one of her own battleships while trying to escape and, probably, already mortally wounded. This was the price which Scheer paid for his "break through." It is possible that it might have been an even higher one had the enemy not made use of the British "challenge" for the night on at least one occasion, thereby disarming an attack, and had our light craft been given more specific instructions as to what duties they might be expected to be called upon to fulfil.

It is of great importance that Commanding Officers of even the smallest unit should be kept as much *au fait* with the situation as is practicable. This especially applies to officers such as those commanding a light cruiser squadron or a destroyer flotilla, who not only require to know the predetermined policy of the High Command but, if they are

really to be in a position to exercise initiative, they must, from time to time, be given an appreciation of the situation and be told what are the C.-in-C's. latest intentions.

Criticism has arisen because our destroyers were not given a more active part to play during the night of Jutland, but the history of that period of the battle emphasises the difficulty of distinguishing friend from foe in the dark and the risk of allowing destroyers to separate from the main fleet to locate and attack an indefinite enemy. This particularly applies, when, as at Jutland, the C.-in-C. is bent on renewing the main action and requires his light forces to be in company at daylight for that purpose.

It is one thing to give destroyer leaders considerable freedom by day, when the opportunity to attack may be apparent to them, and quite another to allow them to prod about in the dark, making spasmodic attacks if they chance to meet the enemy, losing their bearings and getting more and more out of touch with each other and their own fleet. Incidentally, it may be noted that the German destroyers, equally, were not used specifically to search for and attack their enemy on the night of Jutland. They were kept in close touch with the battle fleet.

(6) THE STAFF WORK OF A FLEET ACTION.

(a) AT THE ADMIRALTY.—In the days before wireless or even the line telegraph, the Board of Admiralty, or whatever authority was exercising supreme naval command in London, could do little more than direct the general disposition of fleets and squadrons leaving it to the experience and sagacity of the commanders of the forces afloat to do their best to further the Government's policy.

Under the conditions of the late war, the Admiralty was the centre of intelligence and it was there that the earliest warnings were received of enemy movements. On the First Sea Lord, aided by the Naval Staff, therefore, fell the responsibility for actually ordering the sailing of our main forces whenever there appeared to be a chance of bringing the enemy to action.

Active co-operation by the Admiralty during a fleet action was a new thing until Jutland, and at that date there was less confidence, both at the Admiralty and afloat, in our system of intelligence than, in all probability, it deserved and certainly than there would be now. It was the work of the Naval Staff in London which detected enemy activity, caused the sailing of the Grand Fleet and eventually brought about Jutland. Unhappily, an inter-departmental misunderstanding resulted in commands afloat being given the impression that the German battle fleet had not left harbour up to the moment when it was actually sighted. This, naturally, caused a loss of confidence in subsequent Admiralty reports of enemy movements.

Again, the Admiralty had a clear indication, through an intercepted signal, that Scheer intended making for Horns Reef,¹ so much so that it would have been justifiable for them to have sent a message to Admiral Jellicoe in such terms as "Have intercepted a signal from C.-in-C. of High Sea Fleet, calling for air reconnaissance in vicinity Horns Reef at daylight. Unless you have other information of enemy's intentions, it would appear desirable you should steer a course to enable you to intercept enemy *en route* to that locality."

No communication of this nature was made and a vital piece of intelligence was withheld. This was a failure in staff work, but for which, action might have been rejoined next day. On the other hand, in the existing degree of development of the Naval Staff at the Admiralty and its relations with the High Command afloat, such a direct intrusion into the conduct of operations as this suggests might well have been resented. The lesson remains, however, that under modern conditions it has become of the highest importance to develop the shore intelligence organization, whether at the Admiralty or at an advanced naval base on the other side of the world, and to link it up with the command afloat in a way which will ensure mutual confidence and service.

(b) AFLOAT.—Staff work afloat may be divided into :—

- (i) Intelligence of and about the enemy ;
- (ii) Plotting enemy movements ;
- (iii) Information concerning own ships' movements, especially those detached ;
- (iv) Communications ;
- (v) Recording.

In the Fleet Flagship, each of these duties requires a separate and distinct section of the staff to cope with it ; in the case of lesser commands several will, of course, have to be combined or to a large extent eliminated. At Jutland there were certain failures in staff work, possibly due to the fact that the full requirements of a modern fleet action had not yet become apparent. It is impossible to read the Official History², however, without being struck with the fact that in a number of cases the importance of conveying information of the enemy to the C.-in-C. was not sufficiently appreciated. In ships heavily engaged themselves, it is liable to be forgotten that such engagements may only be incidental to their primary duty, namely, that of keeping the Higher Command informed of what the enemy is doing so that the battle fleet may be brought into action. It is under such conditions as these that a small staff, or even a solitary individual, entirely detached from "ship duties," may be invaluable for collecting intelligence and making *certain* that it is transmitted.

¹ Official History of the War.—Naval Operations. Vol. III, p. 402

² Official History of the War.—Naval Operations, Vol. III,

At Jutland, the main defect from first to last was the lack of intelligence reports although there was a stream of messages passing, many of which were of secondary or no importance. There is, of course, a danger of the Fleet Flagship being swamped by a super-abundance of reports, but her staff organization should provide for a system of "receiving or rejecting" to obviate congestion.

Communications although, seemingly, highly efficient in the battle fleet, proved defective on a number of occasions in other squadrons. In some cases alternative means to visual signalling were not used as a matter of course and regularly. At times they were used, at others they were forgotten or delayed. This, of course, is purely a question of efficient organization in the signal department, but the lesson is that it is incumbent on a commander to ensure that his intentions and orders are made known clearly, concisely and promptly to his command. Failure to do so can only be regarded as reflecting on himself and his staff.

Again, the experience of that battle showed that a commanding officer who has vital information about the enemy should regard communication of that information to the higher command as next only in importance to engaging the enemy. Cases occurred where ships nearer the enemy relied on their divisional flagships seeing what they could see; in other cases, a report was made but never reached its destination. These failures affected the whole subsequent course of events.

Finally, it cannot be emphasized too strongly that the "staff work" of a fleet action is not confined to a little knot of officers grouped round the Commander-in-Chief. An Admiral's "staff" is primarily the Captains of his ships and this should be continually impressed upon them in all peace training. The trained staff officer is a most valuable addition to modern naval personnel, but he should on no account be intruded between a Flag Officer and his Captains. Moreover, commanding officers must not be so "staff ridden" that they lose those powers of initiative and resource which should inspire them to take unconventional action, such as that of a destroyer leaving her station and not being satisfied until she has communicated in some way with the Commander-in-Chief, or that of the Captain of a battleship who does not hesitate to break silence and use his wireless or shaded flashing lamp at night to report sighting the enemy. In this respect the lessons of Jutland are the lessons of Trafalgar and of every great naval battle.

THE BATTLE OF THE MARNE :

GERMAN OFFICIAL ACCOUNT

THE GERMAN OFFICIAL HISTORY OF THE WAR, 1914-1918. VOLUME IV.

DER WELTKRIEG, 1914 BIS 1918. BEARBEITET IM REICHSARCHIV.

DIE MILITÄRISCHEN OPERATIONEN ZU LANDE. VIERTER BAND.

DER MARNE-FELDZUG. DIE SCHLACHT. (Berlin : E. S. MITTLER & SOHN. 18s.).

THE third volume of the German Official History of the War, which was reviewed in the August 1926 JOURNAL, was concerned with the preliminaries of the Battle of the Marne ; the fourth, now available, describes the battle itself, including in it the German retreat from the field and the fighting on the Aisne up to the 14th September, 1914. It ends with the words : " in the severe fighting on the 13th and 14th September the Allies, in their outflanking pursuit on the left, had not succeeded in converting the German retreat into a defeat."

The whole volume, in fact, is devoted to an endeavour to prove that the Germans were not defeated, but merely retired in the moment of victory owing to " misunderstandings." The blame for the loss of ground is placed on the shoulders of General-Colonel von Moltke, the Chief of the General Staff, who through his emissary, Lieut.-Colonel Hentsch, " called off the Western Armies from the victory which by bloody sacrifices they had won at the very moment they were about to gather the fruits of their previous efforts." In heavy type—a curious emphasis in an official history—is blazoned what the German public is requested to believe :—

" The mighty struggle of world-historic importance on the Ourcq and the Marne was broken off. The German right wing left its already won victory to enter on a retreat." Into the claim of victory we shall enquire.

Although the history does not omit some short mention of the events on the left wing and in the centre, and of the general situation, its lengthy narrative of 550 pages is mainly concerned with what happened on the German right.

Events in this part of the field seem to have been accurately described in Volume I of the British Official History, so they may be rapidly summarized. Alarmed for the safety of his right flank, owing to the sudden and unexpected appearance there, on the 5th September, of French troops, under General Maunoury, General-Colonel von Kluck (First Army) in all haste withdrew from the front line, first two corps and then the other two, in order to support his flank guard. He

thus left a gap in the German line of nearly thirty miles between his new left near Meaux and the right of von Bülow's Second Army, then twelve miles south of Montmirail. We learn the new fact that nobody thought of appointing a commander to take charge of the gap. Two independent cavalry corps were left in it, with various infantry detachments, and they retired in divergent directions. They failed to blow up any of the bridges (some had been destroyed by the French in their retreat), and offered such inadequate resistance that the left of the French Fifth Army (General Franchet d'Esperey), the French IInd Cavalry Corps (General Conneau), and the B.E.F. advancing into the gap were able to march ten miles a day, although they had the Grand Morin, a river as wide as the Thames at Oxford, the Petit Morin, a narrow canal-like stream, and the Marne, nearly a hundred yards wide, to cross. The Allies by this advance interposed between the Second and First German Armies.

This was a situation serious enough; but it is by no means the sum of the German misfortunes and we must examine what had happened on the German left and in the centre, which is less well known, and is clearly, though shortly stated in the Official History.

The Supreme Command orders issued in message form on the evening of the 4th September, and quoted in the review of Volume III, were consolidated into a formal operation order on the 5th. They ran: "As regards the left and centre, it will remain the task of the Sixth and Seventh Armies to hold the enemy forces opposite them. As soon as possible they will proceed to attack against the Moselle, between Toul and Epinal, after providing protection against attack from these fortresses.

"The Fourth and Fifth Armies are still in contact with a very strong enemy. They must try to press him continuously towards the south-east. By this means also a way will be opened for the Sixth Army over the Moselle, between Toul and Epinal. Whether in conjunction with the Sixth and Seventh Armies they will succeed in driving considerable portions of the enemy against Swiss territory, remains to be seen.

"The Third Army will take the direction of Troyes-Vendevre (due south). It may according to the situation be used to support the First and Second Armies across the Seine in a westerly direction, or to take part in the battles of our left wing in a south or south-east direction." Actually the Third Army halted and gave itself a much needed rest-day.

Thus, whilst the right wing (von Kluck and von Bülow) was to keep off French attacks from the Paris direction, the left and centre, minus its assistance, were to carry out the original plan of rounding up the main French Army. This operation, for which the whole German array had already proved insufficient, it hardly need be said, completely miscarried. The Sixth and Seventh Armies, under Crown Prince Rupprecht, were unable to make any progress, and on the 8th all attacks were stopped in order to spare the troops, and the Prince was ordered to

"prepare to occupy a rear defensive position at once." No victory is claimed here.

The Fourth and Fifth Armies did no better. Without the heavy guns that Crown Prince Rupprecht had to support his attack, they suffered most severely from French artillery fire and could not advance. At 2 p.m. on the 9th, the Crown Prince (Fifth Army) ordered a night attack, nominally for the purpose of capturing the tormenting enemy guns—in which it failed—actually for the purpose of getting clear—in which it was successful. The Fourth Army, unable to cross the Marne canal and counter attacked, was by the morning of the 9th reduced to finding what shelter it could. It was fought-out. There was no victory in prospect here.

The official history is persuaded, however, that if the battle had been continued success would have crowned the efforts of the Fourth and Fifth Armies. The speculation is unprofitable.

The Third Army, when as a whole it might perhaps have accomplished something, was divided owing to the clamours of its neighbours for help; half went to help the Fourth, half to help the Second. General-Colonel von Hausen, its commander, reported at midnight of the 7th/8th: "Have ordered bayonet attack for all troops at daybreak of 8th." It was this alarming message, together with the desperate state of the right wing, which induced von Moltke to send forth Colonel Hentsch at 10 a.m. on the 8th to find out what was happening, and if rearward movements had been begun to co-ordinate a retreat of the five Armies of the right and centre, "behind the Vesle and the northern edge of the Argonne."

Other factors, besides the actual state of the battle, it may be stated, contributed to the anxiety of the German Supreme Command. The Belgian Army was attempting a sortie from Antwerp; reliable agents reported large transport movements by sea of British and French troops from Bordeaux and Boulogne to the Belgian coast, and the actual arrival of Russians from Archangel in French and Belgian ports; whilst in the East the Austrian forces were in full retreat before the Russians.

What instructions von Moltke gave to Hentsch is disputed. There was, it is said, nothing in writing. And it now transpires that the two men were, after a conference with other officers of the General Staff, closeted together for an hour before Hentsch left, and both are dead. Hentsch, however, rendered a written report to von Moltke on the 15th September. According to this he did not find the situation of the Fifth, Fourth and Third Armies very unfavourable, so he can hardly be classed as a pessimist, which it is the mode at present in Germany to do.

The situation of the Second Army, for which victory is claimed, he reported by message at the time, which he quotes. It was "serious but not hopeless." Its left had been forced back on the 8th by French

attack and von Bülow, its commander, was much alarmed at the situation of the First Army. It was agreed if this did not improve that retreat was inevitable.

When Hentsch reached the First Army, he says, the words with which General von Kuhl, von Kluck's Chief of Staff, greeted him were: "Ja! if the Second Army has bent back its flank (thus widening the gap) we can't stay here much longer." Soon after came a report that "the British have crossed the Marne in three columns . . . and are so far north that even First Army headquarters in Mareuil are threatened. Von Kuhl said "then it is time to shift headquarters," and added that "getting clear of the enemy would best be accomplished by the offensive (of the right wing of this Army) already commenced. The 5th Division had been sent against the British." Hentsch subsequently informed a Court of Enquiry, held in 1917, that orders for the retirement of the First Army had been issued before his arrival. This Court it may be added, found that the Second Army came to the decision to retreat independently, but that Hentsch gave the First Army orders to retire in the name of the Supreme Command.

The official history rejects Hentsch's contemporary report altogether. On the evidence of certain junior officers of the Second Army who still survive, it finds that owing to Hentsch misrepresenting the situation of the First Army—it was hardly necessary for him to persuade von Bülow of its critical position if we are to judge by the latter's own book "*Mein Bericht zur Marne-Schlacht*"—the Second Army decided on the night of the 8th "only to retreat if the enemy actually crossed the Marne in considerable strength and got in rear of the First Army." This decision was acted on; for about 9 a.m. on the 9th came a wireless message from the cavalry: "Strong columns crossing the Marne from La Ferté, eastwards"; and at 10 a.m., a very comprehensive air report was received giving the situation of the heads of five hostile (British) columns which had crossed the Marne. At 11 a.m. von Bülow, hearing nothing from the First Army, ordered a retreat of his Army to begin at 1 p.m., which hardly allowed time for such an order to get down to battalions and be acted on. At 1 p.m. the retreat actually began. The Official History, in spite of its own narrative condensed above, states that von Bülow did not mean to retreat, and that what induced him finally to do so was a wireless message from the First Army, sent off at 11 a.m. and received shortly before 1 p.m.: "Left wing of Army retires on Crouy-Coulombs back to Montigny-Gandelu. IInd Cavalry Corps covers this movement, if possible by attacking the enemy, who is crossing at Charly." We will now quote what follows in the text:—

"Now there came a fateful misunderstanding; this wireless message, sent off by the First Army before Lieut.-Colonel Hentsch arrived, was designed to acquaint his Second Army of the *purely tactical measure of the bending back of the left wing of the First Army* [German italics], but

it was regarded by General-Colonel von Bülow as the long expected news from Lieut.-Colonel Hentsch. He saw in it the beginning of the *general retreat*. [As it really was]. He therefore decided, at 1 p.m., to retreat." And his obedient Army stepped off at that moment as on word of command! And Hentsch, knowing of this decision by telepathy perhaps, at the same instant ordered the First Army to retreat. Wonderful timing.

Although von Kuhl, the Chief Staff Officer of the First Army, now asserts that Hentsch ordered the First Army to retreat, he did not, it is admitted, ask for this all important order in writing; nor did he think the matter of sufficient importance to take the emissary of the Supreme Command—who claimed full powers to act in its name—to see the Army Commander, General-Colonel von Kluck. With great alacrity he issued orders and the First Army began its retreat at 2 p.m. This it appears was possible because a junior staff officer, now dead, quite misunderstanding von Kuhl's intentions, had in error, sent out by telephone at 11 a.m., instead of a warning order for a retirement, an actual order. Why Kuhl thought a warning order of this kind was necessary is not explained. The fact remains that both First and Second German Armies had initiated rearward movements on the morning of the 9th September, and issued definite orders for general retirement by midday (British time).

It remains to investigate the claims that the right of the First Army and the left of the Second were victorious, although it is admitted their other flanks had been bent back and the thirty mile gap in the front thereby considerably increased.

At the definite news of the attack on his right flank von Kluck had, on the 6th, sent his IInd Corps, and then his IVth Corps, to assist his flank guard, the IVth Reserve Corps, and the three formed a line facing West on the river Ourcq, from near Meaux northward. At 10 a.m. on the 7th, von Kluck informed von Bülow that these Corps were in "heavy fight," and at 11.15 a.m., sent a S.O.S. message: "Assistance of the IIIrd and IXth Corps (which he had left under Bülow) urgently required. Please direct their march on La Ferté Milon and Crouy. The Corps started immediately—thus greatly increasing the gap in the front—and for two days, the 7th and 8th September, were wandering between the two battles of the front (Marne) and flank (Ourcq). On the morning of the 9th they arrived on von Kluck's extreme right. Their condition is thus described in the text:—

"The IIIrd and IXth Corps had made a forced march in very hot weather and on dusty roads, which must be accounted the record of the German Western Armies in this period. Both Corps had, on the 6th September, victoriously stood (that is they had not retired) a severe fight with a vastly superior enemy (4 divisions against 2 French cavalry divisions and 2 divisions); immediately after this they had

covered about 36 miles, and had been 'alarmed' in the night at 2.15 a.m. on the 8th, after a short rest, in order to reach the right wing by a forced march. With a short midday pause, the troops marched until dark; the effort of this day (8th) amounted from 36 to 42 miles. All day the sun had poured its scorching rays on the forward-striving troops. The fearful dust in combination with the glowing heat had greatly added to their sufferings. The men could hardly breathe, their tongues dry with torturing thirst clung to the roofs of their mouths¹. . . "The march casualties were in truth not inconsiderable, but did not affect the offensive value of the Corps." In the diary of the G.S.O.I. of the IXth Corps, Major von Auer, it is written as regards this march: 'The sight of our proud troops will never be forgotten by me. It was touching to see how painfully these thinned ranks dragged themselves on and yet gave of their best.' These troops arrived on von Kluck's right late at night on the 8th; the 5th Division (IIIrd Corps) having been, at 10 a.m., marched back to Lizy, to help deal with the British advance. The remaining three divisions, under General von Quast, "with thinned ranks," probably in strength about three British brigades, did not attack early on the 9th, it was not until 9.30 a.m. that their infantry was deployed. The orders they received are not given; but starting eastwards they seem gradually to have wheeled south-west and at noon, after imperceptible progress, received definite directions to attack towards Haudouin to *cover the retirement* (retreat) of von Kluck's left wing. Von Quast was fortunate in having the unexpected assistance of a Brigade (Lepel's) which marching from Antwerp arrived north of the field of battle at 2 a.m., and was directed to make an enveloping attack on the French line. The Official History claims the victorious advance of everybody. Unfortunately two officers of Lepel's Brigade have written an account of its operations—not referred to in the Official History—and it is not necessary, therefore, to quote French authority to disprove the German official claim. This account states: "The attack came to a standstill west of Nanteuil. The enemy was continually reinforced and strong hostile artillery came into action. . . . The situation of the brigade became more and more critical, for one of the enemy's cavalry divisions, with artillery, appeared in its rear. . . . No signs being seen of the right wing of the German First Army [von Quast's 'victorious' troops]. . . . General von Lepel, after an inward struggle, decided to break off the fight."

The claim of the victory of von Kluck's right, from which it was pulled away by superior order, has therefore no foundation in fact. It is indeed completely traversed by French accounts. But its action did delay pursuit.

We therefore turn to the second victory, alleged to have been

¹ Some will recall the marches in South Africa, 1899-1902, the tongues of the infantrymen black and protruding from their mouths.

gained by the Second Army in the centre against Foch's Ninth Army. On the 6th September, von Bülow began carrying out the Supreme Command order to face towards Paris, between Seine and Marne, that is he was taking up position, NOT attacking. The VIIth Corps on the right swung back towards Chateau Thiery, pivoting on the Xth Reserve Corps next it, which moved slightly up. The other two corps, Xth and Guard, were to advance south-westwards, so that the Second Army would by evening face south-west. The Xth Corps came under "superior enemy artillery fire," found localities "held by a strong enemy," and failed to make progress. The Guard had some success and pushed the French back from the Marais de St. Gond; but the fight "acquired an increasingly serious character." The general result of the 6th was that "a lively fight had developed on the whole front of the Second Army, without any actual success being attained." On the 7th, when von Kluck removed his IIIrd and IXth Corps from the right of the Second Army, its position became alarming to its commander, and he called on the Third Army for help. His right (VIIth and Xth R. Corps), swung back, had a quiet day; the Xth Corps had "extraordinarily lively fighting," localities changing hands, without result. The Guard Corps "lay in heavy French fire and at dusk came back and dug in." General von Hutier, the commander of one of its divisions, sending troops back to prepare the passages of the Marais de St. Gond for defence. To sum up, the 7th, "A very serious tone prevailed at Second Army headquarters in the evening. Against the greatly weakened right wing marched enemy reinforcements; the British seemed to wish to push forward into the gap. Also, on the left wing, the situation was uncertain."

To improve its desperate position this left wing, with part of the Third Army, made the dawn attack, already mentioned, on the 8th; it had some success at first, but was eventually held up by artillery fire. By midday it came to a stop: "The obviously increasing fire effect of the enemy batteries and the over fatigue of the troops combined to bring the attack to an end at 2 p.m." The heat of the day and the previous exertion of the troops and "heavy losses" led "officers and men to fall asleep where they lay." The right wing meantime was falling back, and reports of the advance of French and British into the great gap continued to arrive. At this point, as we know, Lieut.-Colonel Hentsch reached Bülow's headquarters.

On the 9th the right wing continued to swing back, by order. In the Xth Corps, the 19th Division "held its sector untroubled"; the 20th "remained essentially in its positions taken up the previous day," but its right regiment "stormed, before noon, Mondemont village and Castle," and the 14th Division sent to help it secured Le Mesnil. The Guard Corps made distinct progress south-westwards, in spite of counter-attacks; but, as is notorious, not enough to dishearten General Foch. This small tactical success hardly entitles the Official History to say, in italics: "*The Marne seemed decided in favour of the Germans.*" Besides,

we know for certain, that when Grossetti's division, sent by the victorious General Franchet d'Esperey—when the Fifth Army was driving back Bülow's right and pressing into the gap—to help Foch out of his difficulty, arrived at evening to take the Prussian Guard in flank, the Germans were gone—clean gone—even beyond range of his guns, and Mondemont had been re-taken. A victory therefore is claimed by the Germans for a temporary gain of ground which they abandoned before the French counter-measures took effect. It is more than doubtful, too, whether the Germans had the means of exploiting this success, even if Grossetti had not been available to counter them. The Guard Corps had lost heavily at Charleroi; it had lost still more heavily in the three-days' battle of Guise (St. Quentin), when it had to recross the Oise; one regiment, whose history has been published, the Garde-Grenadier Regiment No. 3, for once gives figures and admits that its losses at the Marne "in dead and wounded (i.e., not including prisoners) in the last three (not whole five) battle days, were 20 officers and 726 other ranks." The total is therefore more than 746, probably nearer 1,000. It probably had 250 casualties at Charleroi and 750 at Guise, and certainly had heavy march casualties. The Guard Corps reduced by such losses would, on the afternoon of the 9th September, be at about a third of its establishment—for no reinforcements had been received—a couple of brigades instead of divisions. Such "thinned ranks," like Kluck's Corps, would be quite unfit to meet the onslaught of a fresh French division, brought up to establishment by the drafts it had received during the retirement. This factor of battle strength is not alluded to by the German History—except a report of von Bülow's before the last day's fighting, in which he said the losses in his four corps amounted to more than one corps. It omits all mention of casualties; but although the extraordinary courage of the Allied troops and the rapid decision of their commanders, and the lack of such qualities in the German Generals, must always remain important factors, yet the big battalions of the French were the decisive one. Counting by divisions the forces at the Marne were not unequal, but counting rifles, the Allies were probably 2 to 1, and at such odds Germans have never won victories; these have been gained over what they call "ebenbürtige" foes, only when they, and not the enemy, were 2 or 3 to 1, and not always then.

The arguments adduced and the statements asseverated in the volume are too reminiscent of the speech of a defeated general at a manœuvre conference to be objective history. No rhetoric can change the result reached on the field. The claims to two successes—really only local and fugitive—and to the power to exploit them into a decisive victory—with battle-worn and half-strength units—disappear into thin air on examination. It is unnecessary to italicise the statement, but the only victory gained at the Marne was that won by the French and British. This the Germans understood so well that there is no mention of the battle in their communiqué.

THE ROYAL AIR FORCE FLIGHT FROM CAIRO TO THE CAPE

By WING COMMANDER C. W. H. PULFORD, O.B.E., A.F.C., R.A.F.

On Wednesday, 8th December, 1926, at 3 p.m.

LIEUTENANT-COLONEL THE RIGHT HON. SIR SAMUEL J. G. HOARE, Bart.,
C.M.G., M.P., Secretary of State for Air, in the Chair.

THE CHAIRMAN in introducing the Lecturer, said: "I should like in two or three sentences to add a word in introduction of what Wing Commander Pulford is going to tell us.

First of all, it seems to me that a flight of this kind is worthy to be classed with the great travels of past centuries and past generations. But, besides that, it is an example of sound organization. I feel sure that this afternoon Wing Commander Pulford will give us details of the care that was taken in the preparations. I think people sometimes fail to realise the need, not only in these great flights, but in all the activities of flying, for a careful organization of all the details—the details of the machines, the details of the engines, the details of the weather, the need for careful discipline and supervision day after day during the continuance of the flight. If I may say so, it seems to me that Wing Commander Pulford, and his officers and men, give us a shining example of the successful way in which those details were not only foreseen but were dealt with day after day.

But the interest of the flight does not end either with its romance or with its organization. Its most important aspect, it seems to me, is to be found in the fact that it illustrates a phase, and perhaps the most vital phase, of the development of the Imperial Air Force in respect of Empire defence, and in the progress we are making towards the attainment of full mobility, which is vital to the effective and numerical employment of air power. Suppose, for instance, our Imperial air routes are organized from one end of the Empire to another; suppose, again, that there is a system of the closest co-operation both in training and in policy between our own Air Force and the Air Forces of the Dominions, how mobile a force and how effective a force we shall then have for concentrating upon any threatened point in our world-wide Empire. I am glad to think that, during the last two or three weeks, we have had at the Imperial Conference most valuable discussions upon these points, and I hope that as a result of these discussions we shall see great steps made in the near future. If I might give you a single example to show upon what I base my hope it is this. During those discussions we considered in particular the two great Imperial air routes of the future—the route from here to Cape Town and the route from here to Australia. The route from here to Cape Town, Wing Commander Pulford will describe to-day from his own

personal experience. Now, on both those routes we were able, as a result of the discussions we had at the Imperial Conference a few weeks ago, to arrange that next year a number of flights should be made along them by our own Air Force, in one or two instances by civil machines and by the machines of the respective Dominions' Air Forces.

If I take the case of the African route, there we are arranging in the near future to have a certain number of flights carried out from one end of Africa to another by a system of co-operation between the various Governments concerned. In the North of Africa, British Air Force machines will link up from Egypt with a number of civil flights which are being made between Egypt and Kenya by civil machines. At the Kenya end the South African Government have undertaken to make one or more flights to link up with the Northern and Central sections, and by that means to have these long-distance flights carried out from time to time from one end of Africa to another.

So, also, with the other great long-distance Empire air route, the route to Singapore and Australia. There, again, Mr. Bruce, on behalf of the Australian Government, has undertaken to link up with any flights that we may be able to make with military or civil machines, or more probably with both civil and military machines, either next year or in years to come.

Now this, I admit, may be a small beginning, but I am quite confident it is the beginning of a very big development. When once we have had these regular flights made over the African and Australian routes, when once we have got the aerodromes regularly organized and properly maintained, we shall find that not only have we got a great asset for civil and commercial purposes, for the civil air lines of the future, but that we have a great commercial asset for military purposes as well. We shall then be able to feel that the air forces of the Empire are really mobile, that they can move across the face of the Empire from one end to the other, and that we can concentrate them upon any point, whether it be over land or sea, in an incredibly short time.

Wing Commander Pulford's flight is of very great importance as being one of the pioneer flights in this great development. It is one of three flights that were carried out with the same object by the Air Force last year. There was the flight from Cairo to Nigeria; there was Wing Commander Pulford's flight to the Cape and back to London; and there was the flight carried out with flying boats to Alexandria. We intend to make these long-distance flights a regular part of normal service training, and we hope next year, and perhaps still more in the years afterwards, to see a number of them carried out.

Wing Commander Pulford's flight was not only a great personal achievement, but it marks a stage in the future development of the mobility of the British Air Force.

LECTURE.

I have been asked to lecture here to-day on the "Cape" flight which was recently undertaken by four machines of the Royal Air Force and of which I happened to be in command. I may as well confess now, before you have an opportunity of discovering it, that I am no lecturer. It really is much easier to fly to the Cape and back than it is to lecture on it.

The flight was not carried out as a "stunt," or to break records. It was undertaken with certain very definite objects in view. These objects were as follows:—

- (1) To visit the Dominion of South Africa and the various Colonies *en route* ;
- (2) To gain experience in long-distance flying in formation, keeping to a scheduled time-table, and thus to test the regularity with which reinforcements could be sent by air ;
- (3) To gain experience in flying through changing conditions of climate ;
- (4) To co-operate with any local military forces *en route* ; and
- (5) Last, but not least, to visit the South African Air Force.

As originally planned the flight was only from Cairo to Cape Town and return. On arrival at Cape Town, however, we received orders that the flight was to be continued home to England, with the same machines converted to seaplanes.

Before the flight took place there was a good deal of preliminary work which had to be done. The route had to be organized, depots laid down, landing grounds reconditioned and provided with petrol, oil and stores. The machines for the flight had to be modified and the equipment which each machine would carry gone into very closely. Maps, communications and landing ground schedules had also to be studied carefully.

The route was as follows:—Cairo, Assiut, Aswan, Wadihalfa, Atbara, Khartum, Kosti, Malakal, Mongalla, Nimule, Kisumu, Mwanza, Tabora, Abercorn, N'dola, Broken Hill, Livingstone, Buluwayo, Palapee Road, Pretoria, Johannesburg, Bloemfontein, Beaufort West, Cape Town. Except for visiting Kimberley, Nairobi and Jinja, the return flight was over the same route. The total distance was roughly 11,000 miles. The route just mentioned was the one selected by the R.A.F. in 1919 which Sir Pierre Van Rynevald and Sir Quentin Brand followed for most of the way, when they made the first successful flight to the Cape in 1920. The time table laid down for the flight was briefly, leave Cairo on the 1st March, 1926, arrive Cape Town, 12th April ; leave Cape Town, 19th April, arrive Cairo, 28th May. This appears to be rather a long time, but actually it allowed a stay of from two to three days at nearly every landing ground, and a stay of a week at Cape Town, while a stay of twelve days was allowed for at Pretoria, as the Capital of The Union is also the Headquarters of the South African Air Force. The Flight managed to keep to this time-table the whole way: in fact, we landed at Cairo a day ahead of time, but that was because we wanted to gain a day on the time allowed for changing our undercarriages and converting our machines to float planes for the sea flight home.

PRELIMINARIES.

For supply purposes the route was divided into three sections: Northern, Central and Southern; The Northern section stretched from Cairo to Nimule on the Sudan-Uganda border, and for these purposes came under the Air Officer Commanding Middle East. As far as Khartum supply was a fairly simple matter, since the landing grounds between Cairo and Khartum were in general use and were well served by the railway. South of Khartum, however, matters were not quite so simple. All transport had to be done by river steamer which took longer, and as river steamers do not go beyond Rejaf, to get to Nimule meant a long march as well. The supervision of all landing grounds in the Southern Sudan was done by Flight Lieutenant Kinkead, D.S.O., D.S.C., D.F.C. This officer left Cairo at the end of December, 1925, though the Flight did not arrive in his section till the 8th March, 1926.

The Central Section extended from Jinja in Uganda to Abercorn in Northern Rhodesia. An R.A.F. officer and four men were detailed to look after it. By air these places are not many hours apart. One could, for instance, by flying hard, leave Jinja in the early morning and be at Abercorn in the evening, but to reach Abercorn from Jinja in the normal way is a journey of some weeks. One has to go by lake steamer from Jinja to Kisumu, thence by rail to Mombasa, from there by sea to Dar-es-Salam, from there by rail to Ujiji on Lake Tanganyika, and from there by lake steamer to a place called Kituta some sixteen miles from Abercorn. The officer in charge of the Central Section, Flight Lieutenant Emmett, M.C., D.F.C., left England early in November, 1925, and had only just enough time to visit all the grounds before the Flight arrived in his section on the 13th March. The duties of Flight Lieutenant Emmett were to see that all landing grounds were in good condition and that the petrol, oil and stores were in place by the time the Flight landed in his area.

The Southern Section stretched from N'dola (N. Rhodesia) to Cape Town. An R.A.F. officer, Flight Lieutenant Reason, with two men was detailed to look after this part of the route. His duties were similar to those of Flight Lieutenant Emmett. His work did not take him quite so long, since all the landing grounds were well served by the railway, and in the Union of South Africa all the landing grounds were in good order and in frequent use. Two depots for stores were laid down, one at Kisumu on Lake Victoria and one at Pretoria. The former had in addition one spare machine and two spare engines, whilst the latter had one spare machine and four spare engines.

The provision of petrol, oil and landing ground stores at each landing ground south of Nimule was done by the Asiatic Petroleum Company, though, of course, the quantities were worked out by the Air Ministry beforehand. I should like to acknowledge here how well

the Company organized the supply of fuel at each landing ground. The amount of petrol and oil at each landing ground was calculated on a basis of empty tanks on arrival both out and back, plus 40 per cent. in excess to allow for evaporation and leakage.

PERSONNEL AND MACHINES.

I think that gives you, briefly, a description of the ground organization of the route, and I propose to describe next the work and organization necessary from the machine and personnel point of view. The machines selected for the flight were Fairey III D's. The reason why they were chosen was because this type had recently done very well in the tropics at Singapore. They were equipped with the Napier Lion V engine which is the standard water-cooled engine of the Royal Air Force.

The personnel of the Flight consisted of six officers and two N.C.O's. Of the six officers four acted as pilots and two as spare pilots. One of the spare pilots was the technical officer, the other did navigating duties. One of the N.C.O's was a fitter, the other a rigger.

Several slight modifications were made to the machines. The Fairey III D. is normally a three-seater, but for the flight the middle seat was occupied by a small petrol tank and the lockers in which we carried all our gear. Special tip-up seats were fitted for the observer. Tropical radiators and larger oil tanks were installed; to guard against punctures extra thick treaded tyres were fitted to the wheels. Wireless was not carried for the following reasons: It was heavy; it required the services of a skilled operator to work and maintain it; it was doubtful whether it would be of any practical value to us.

In deciding on the equipment and spares to be carried by each machine, we were governed by one consideration only. This was that, come what may, we would not fly with the machines overloaded. The reasons are obvious, but the natural tendency was to try and take everything we could. An overloaded machine is at a great disadvantage. A greater strain is thrown on the engine, and the machine itself takes a longer run to get off, and lands faster. As the majority of our landing grounds were at high altitudes on which a machine needed a longer run to get off than it did in England, we could not afford to be overloaded. The normal weight of a Fairey III D. is 5,050 lbs. After taking into account the various alterations and additions made to the machine, we found that we had 350 lbs. to play with; 350 lbs. may seem a lot, but when we came to fit things in it seemed very little. Weight mounted up in an incredible way, and we had literally to consider the utility of everything purely and simply from how much it weighed. There was certain equipment such as maps, tools, spare wires, wheel chocks, screw pickets, kit, emergency rations, medical outfit, rifles and ammunition

which all machines had to carry, but the heavier items had to be split up amongst the four machines. The heavy spares consisted of spare propellers and wheels, magnetos, tail skids and jacks. Two machines carried a spare propeller and two a spare wheel, whilst the machines which did not carry spare magnetos carried a tail skid or jack. Our aim was to get all machines to weigh exactly the same if possible, thus ensuring the same strain being thrown on all four engines.

The question of emergency rations and medical stores was gone into carefully. There was always the possibility that a machine might be forced to land through engine trouble some distance from the nearest landing ground, in which case rations and medical equipment would probably be required. The question of weight decided the type of rations we could take.

The standard twenty-four hour emergency ration for one man weighs about 3 lbs., and as we wanted something that would last two men for ten or twelve days the total weight of rations would have been prohibitive. As the Mount Everest expedition must have been faced with the same sort of problem, we decided that our rations should be similar to theirs. It may be that a ration which was good for individuals working in an altitude of over 20,000 feet in extreme cold would not have been at all suitable for men in a hot climate; however, we didn't worry our heads very much about that, and as we had no forced landings, I am unable to give an opinion on their suitability. The weight of the emergency rations came to 20 lbs. and was calculated to last two men for ten days. Our medical equipment for each machine came to a total weight of 8 lbs. It consisted of such items as quinine, iodine, aspirin, permanganate of potash, bandages and morphia.

The amount of kit permitted to be carried by each individual was 32 lbs., this included the weight of a hammock, ground sheet and sleeping bag. Though small, it allowed each individual to carry a change of uniform and two or three changes of underclothing. When in South Africa, however, we were able to launch out a bit more as we had had our plain clothes and blue uniform sent out there to await our arrival.

The question of maps was rather interesting. In England, one generally flies on a map scale of 1/250,000, or four miles to the inch. But if that scale is used when flying from Cairo to Cape Town, the number and weight of maps which would have to be carried would be too great, and the space which they would take up would be quite out of the question. After looking at all the maps available for the route, it was decided to use a scale of 1/2,000,000 or approximately thirty-two miles to the inch. This scale took us as far as Bloemfontein, but South of that there was really no good flying map under a scale of 1/2,500,000 or forty miles to the inch. Before we started, none of us had ever flown on such a small scale but when we came to use them we found the maps

very accurate and easy to fly by. The total weight of maps carried by each machine came to 9 lbs. Each stage had its own map pasted on a piece of mill board, on the back of which was pasted a large scale map of the vicinity of the landing ground at which the Flight was to land.

The Flight formed early in November, 1925, though it was not complete with personnel till the end of the month. The machines were not ready for air test until the beginning of December. However, we were kept pretty busy getting flying practice on machines of the same type, checking stores, obtaining kit, studying maps and schedules of landing grounds. By the middle of December all machines having been air tested, they were shipped out to Aboukir, the Flight personnel sailing a little later. Here I should like to acknowledge the great assistance given to the Flight by the Fairey Aviation Company and by Napiers, Ltd., during the time we spent at home getting ready. These two firms were extremely helpful and did everything they possibly could to assist us.

On arrival at Alexandria the machines were transported by road to the Aircraft Depot at Aboukir and erected. From the end of January (the machines didn't arrive till about the 25th) till the end of February, we were hard at work putting final touches to our machines. We thought we had done everything at home, but we found there was still lots of little things to do. Beyond carrying out petrol consumption tests and a practice formation or two, however, we did not do very much flying, as it was essential to limit the engine hours if the same engines were to be used throughout. When we started the flight each engine had done about seven hours running. Whilst in Egypt the personnel of the Flight went into training so as to get absolutely fit before starting. We used to run a mile or two every evening after we had finished work. The result of our training was that we started the flight in as fit a condition as any of us had ever been, and though, as events proved, we had no hardships to endure, I think our training repaid us, for none of us fell sick during the flight and nobody felt any undue fatigue at any time.

THE FLIGHT.

That brings me to the end of the preparatory period of the flight, and I will now turn to the flight itself. First, I think I had better describe the routine we followed in the air and on the ground, since we kept to it the whole way through the flight. In the air when flying from place to place the machines flew in open V formation, the distance between machines being about 500 yards, all machines being roughly the same height. Although we had no forced landings, we had to have an organization in case one of the machines did come down. For this purpose the Flight was split up into two Sub-Flights, the leader in one and the deputy-leader in the other. In case a machine of one of the Sub-Flights had to land, the other machine of the Sub-Flight followed

it down. If it was possible to land without damage the pilot of the stand-by machine would do so and give assistance, the remainder of the Flight flying round. But if it was not possible to land, the whole Flight would proceed to the nearest landing ground and send out help. The pilot of the stranded machine could act as he thought best once he was on the ground. As a matter of fact, between Tabora and Buluwayo there were not many places where a machine could land without damage, so that if any of us had landed the probability is that the occupants would have had a long walk.

On approaching a landing ground the Flight took up close formation and maintained it until broken up by signal from the leader when over the ground. On landing, after the usual introductions to the local government and military authorities had been made, the Flight used to start work on their machines. Each pilot filled up his own machine with petrol and oil, thereby leaving the technical officer and fitter sergeant free to carry out the routine inspection of the engines, the rigger sergeant in the meantime going round all the machines from a rigging point of view. After the routine inspection and filling-up was finished, machines were secured and lashed down head on to the prevailing wind. We found it generally took from three to four hours' work, sometimes even longer before everything was finished. It meant hard work but we always tried to get the machines inspected and ready for flying again immediately after we landed in order to allow us plenty of time to do what we liked the next day.

Before leaving we used to allow ourselves three-quarters of an hour on the landing ground in order to pack away our kit, unlash the machines and test our engines. Unless the ground was too small or the soil too sandy, we always took off in formation. Whenever possible, we took off as early as circumstances permitted in order to avoid the heat of the day. On the return trip, when in the Sudan and Egypt, we took off at dawn.

Communications.—The next point to touch on is communications. In England it is easy enough to send a signal to tell people you are coming and what time to expect you, but in parts of the Southern Sudan, Tanganyika, Uganda and Northern Rhodesia, communication is not quite so swift. Telegraph lines are sometimes broken down through storms or other causes, and telegraphic messages have in certain places to go a very long way round before they reach their destination. As an example, a wire from Mongalla (S. Sudan) to Kisumu (Kenya) has to go *via* Khartum to Port Sudan, from there by cable to Mombasa and from there by land line to Kisumu, whilst a wire from Tabora to N'dola has to go by cable from Dar-es-Salam to Durban and thence by land line. On the homeward flight a wire was sent to Abercorn from Pretoria fourteen days before we were due to land there, but we found on arrival that the message had arrived only five minutes before we did.

The wires were down and the message had had to be brought over a hundred miles by runner. Again, on the homeward trip when flying between Kisumu and Jinja, we carried no less than eighty-seven telegrams for re-transmission after we landed. All telegraphic communications between Kenya and Uganda had broken down owing to storms the night before we left. In Egypt and the Northern Sudan and from N'dola southwards, however, the communications are very good. It will be realized, therefore, how essential it was for us to fly to programme, and since large numbers of people always came to see us land, we had, if possible, to arrive at a certain definite time. Except for places like Abercorn where telegraphic communications were slow, we used to send off a wire giving this information the day before we left. We rarely, therefore, received a weather report before starting.

Weather.—Leaving communications we come to weather. On the outward trip we had, on the whole, extremely good weather. We struck a sandstorm at Khartum which made the visibility very low for days afterwards, though why this should be is a thing I cannot explain. The Governor of the White Nile Province, whom we met at Malakal, said he had never seen anything like it before. It certainly was rather extraordinary, for the low visibility persisted until 100 miles south of Nimule, a distance of about 1,100 miles. The rainy season had started in Kenya by the time we arrived and was ceasing in Tanganyika when we passed through on the way South. We experienced a good deal of rain when on the ground, but in the air we managed to dodge any rainstorms that we saw. These storms are very sharply defined and can nearly always be avoided. The visibility in the Central and Southern Sections of the flight was extreme. The fact that we were able to see the spray of the Victoria Falls when over seventy miles away from them illustrates how wonderfully clear the air was on this part of the route.

On the homeward flight we had good weather until we reached the vicinity of Lake Victoria. The rainy season was still on. Between Tabora and Kisumu we had rather an unpleasant flight. We ran first into clouds which stretched from the ground to about 16,000 feet, and after we had cleared them, into a series of heavy rainstorms. The Flight split up and each machine found its own way to Kisumu. Speaking for myself, this part of the flight was quite exciting as we narrowly missed hitting the tops of trees and the sides of hills. The general situation was not improved by the fact that our petrol was running short whilst we were still some distance from Kisumu. What made it more aggravating was to find that the emergency petrol specially carried for such an occasion in tins in the rear seat could not be pumped into the tanks as the pump had jammed. However, we landed all right.

At Athara we were detained for a day by a sandstorm which made the visibility very low for forty-eight hours afterwards. It is extraordinary

how quickly these sandstorms spring up. On this occasion another officer and I were on the aerodrome at sunset and noticed what looked like a wall of fog some five miles to the South-East. As the wind was from the North and blowing quite fresh, we thought it had missed us. However, inside twenty minutes we were enveloped in a cloud of flying sand with the wind blowing from the South-East in gusts up to thirty-five miles an hour. Sandstorms appear generally to occur at sunset, though two days after leaving Atbara we flew over a small one at 4 p.m.

We were blessed with following winds nearly the whole way to Cape Town and back. After Khartum, on the way North, we experienced a contrary wind on the ground, but over 4,000 feet it died away and became, if anything, Southerly. We experienced one interesting example of how much the wind varies with height. When flying between Cape Town and Victoria West with the wind behind us, two machines flew at 8,000 feet and the other two at 4,000 feet. The upper machines without increasing speed rapidly drew away from the lower, although the latter opened up their engines to the maximum to keep up. The wind at 8,000 feet was thirty miles an hour, whilst that at 4,000 feet was only ten to fifteen miles per hour.

Africa, to the average person, is generally associated with heat, and since none of us had ever been out there we expected to find it extremely hot. We imagined that the Equator would be the hottest part of all, but we were pleasantly surprised. Egypt and the Sudan lived up to expectations, for it was 105 degrees in the shade at Khartum on the 5th March and 115 degrees when we landed there again in May. Mongalla and Malakal were also very hot and sticky. The shade temperatures at these two places were not so high, but the air being more humid made one feel the heat to a greater extent. Though it was warm from an English standpoint at the remainder of the places we landed at, it was never uncomfortable. It was quite cold at Cape Town. Landing in the Sudan was an experience which to me never lost its novelty. At 6,000 feet it was cool, at 2,000 feet one began to feel warm, whilst on landing the blast of hot air on one's face felt as if a furnace door had been left open. The subject of heat naturally leads to clothing. We used to fly in khaki slacks or jodhpurs and woollen Bush shirts. These we found were neither too hot on the ground nor too cool in the air. On the return flight between Cape Town and Pretoria we flew in Sidcot suits as it was cold when flying.

The Country.—I think that exhausts the subject of flying conditions and we come next to a description of the country flown over. In a flight of over 5,000 miles it is extremely difficult to give more than a short general description of the country flown over. In Egypt the main impression received was that of a sluggish river flowing between a narrow strip of vegetation which grew narrower as we flew South. On both sides of the river the desert stretched as far as the eye could

reach. After Luxor this strip of vegetation practically ceased altogether. The Northern Sudan appeared from the air to be a wilderness of sand with numerous black and rocky hills dotted about.

Two hundred miles South of Khartum the desert gave way to scrub, and from there southwards the vegetation increased. The country then alternated between sparse bush, thick bush and flat open plains. Between Malakal and Mongalla is the Sudd Region which is one vast swamp. Our course took us clear of most of it, but from what I saw of the Sudd it struck me as being a most unpleasant locality to be stranded in. The country rose gradually the whole way to Mongalla, but after that it rose rapidly until the central African plateau was reached at Kisumu. The Eastern shores of Lake Victoria were marshy, but further inland the country was wooded and hilly. North of Tabora there were many open spaces, but South of Tabora and until close to Buluwayo the country appeared to be all forest, the monotony being relieved by a few open spaces which were probably marsh. Bechuanaland also appeared to be covered with a good deal of bush. Except for the mountainous district between Beaufort West and Cape Town, where forced landings would have been difficult, the country we flew over in the Union of South Africa was, from a flying point of view, one of the best in the world. We could, if necessary, have landed practically anywhere.

Landing Grounds.—I will turn now to the landing grounds. Altogether there were twenty-four landing grounds on the route. We experienced no difficulty either in landing or in taking off any of them. I attribute this fact to three reasons: Firstly, the machines were not overloaded; secondly, the Fairey III D. is fitted with camber gear which enables it to get off very quickly with full load on board. It also pulls up very quickly after landing. Lastly, we always tried to take off before the sun was well up in order to obtain a greater air density when taking off. The main trouble likely to be encountered when landing in the Southern Sudan, Tanganyika and Northern Rhodesia is that the grounds become very soft and boggy after rain. In places this could be got over by draining, but in the Southern Sudan where the ground is cotton soil, I think specially prepared grounds would have to be made if the route was to be used all the year round.

Navigation.—I have dealt with most aspects of the flight, but so far I have not dealt with navigation. We flew practically entirely by compass the whole way. On the way South between Khartum and Malakal we followed the Nile, as it was very thick and not possible to check the position from the map. Our greatest error in position on any flight was twelve miles in a distance of 350, but this was due to having to make large alterations of course to avoid a number of rainstorms which barred our path. The visibility made things easier, of course, but all the same I think Flight Lieutenant Gillman, who was navigating,

deserves great credit for his accuracy. I have already mentioned that we found the maps we used wonderfully correct and easy to fly by. Our compasses were carefully corrected for deviation before we left Cairo. They were swung again at Pretoria on the way South and again on the way North. We found the deviation of the pilot's compass had altered a good deal, but that of the observer's compass had not.

The height at which we flew was dictated mainly by the temperature of our radiators and of our oil. We aimed to keep the former at 70 degrees Centigrade with radiator shutters open, whilst the latter was kept below 60 degrees Centigrade. To do this we found we had to fly at 6-7,000 feet over Upper Egypt and the Sudan, but elsewhere we flew at an average height of from 3-4,000 feet above the ground. There were, of course, occasions when mountains made us climb higher, for instance, to reach Cape Town and Nairobi we had to climb to over 11,000 feet.

Reliability.—I mentioned earlier in the lecture that the Flight kept to time-table throughout, but this was very largely due to the fact that the machines developed no serious defects. The defects developed on the flight were really very few. We had to change a magneto on one machine at Mongalla on the way South. On reaching Cape Town we had to change all our oil tanks as they were found to be split. On the homeward flight we had to change two of the propellers as they were damaged by flying through rain. Apart from these rather minor repairs we had no trouble at all. To my mind the fact that on a flight of 11,000 miles with the machines out in the open practically the whole time, we experienced virtually no defects, bears high testimony to the reliability of the Fairey III D. and the Napier Lion engine. It also reflects greatly to the credit of the technical officer, Flying Officer A. Jones, and our two sergeants for the way in which they looked after the machines.

Another matter of note was the great interest taken in us by the inhabitants of the places we passed through. Large crowds used to meet us whenever we landed, and everybody we met seemed very pleased to see a service Flight on its way through Africa. We received boundless hospitality wherever we landed. The dinners and dances to which we were invited were legion, in fact I may say that we found it very much more tiring on the ground than in the air. The native population in Kenya, Tanganyika and Northern Rhodesia regarded us with amazement not unmingled with awe. They gave us all kinds of names, some called us "The Birds," others called us "The King's Birds." I think, however, the best of all was the remark of a Christian boy over whose village we flew. The remainder of the village, who were mostly pagan, declared the gods were coming; the Christian, however, thought we were Matthew, Mark, Luke and John! What appeared to impress

the natives most was the speed at which we covered distances, which to them represented weeks and even months of travel.

THE SOUTH AFRICAN AIR FORCE.

Before turning to the sea flight on the last stage of the journey home, I must refer to the South African Air Force. This Force is not large; it consists of a Headquarters, a Flying Squadron, a Training Flight and an Aircraft Depot; the pilots number about twenty-five. It is, nevertheless, extremely efficient and the pilots do a great deal of flying. The whole Force is concentrated at Pretoria, but landing grounds have been laid down throughout the Union so that machines can reach the most distant point in a day. Up to date the Force has been used for three operations and has proved its value. The machines are all obsolete, no new aircraft having been purchased since the Imperial Government presented the machines as a gift to South Africa in 1919, but in spite of this they serve their purpose very well.

The Air Force in South Africa is bound to grow. In a country of vast distances, where the white population is small and which is always faced with the native problem, as well as that of defence from overseas aggression, an arm which possesses powers of concentration and mobility vastly superior to any other must eventually become a very important force.

THE LAST STAGE.

There remains to describe the sea flight from Egypt to England. We were allowed ten days in which to change our wheel undercarriages to floats and to prepare for the sea flight. The machines were thoroughly overhauled and examined during this period. The route was Aboukir, Sollum, Crete (Suda Bay), Phalerum Bay (Athens), Corfu, Brindisi, Naples, Orbetello, Berre, Cette, Hourtin (Bordeaux), Brest and Lee-on-Solent. The total distance being about 2,700 miles. The timetable was: leave Aboukir, 9th June; arrive Lee-on-Solent, 21st June, with a stay of two days at Phalerum, Brindisi, Naples and Berre. We adhered to time-table, though we had to make up time on the 20th June owing to being delayed for a day by a Northerly gale at Cette. Except for the last three days we had good weather the whole way. The last three days, however, were rather a trial. They consisted of a gale between Berre and Cette, a fog across France where we had to fly at 50 feet, and the thickest of thick fogs between Brest and Lee-on-Solent. Apart from this, however, the flight was without incident. We used the same engines throughout, and the last time I flew my machine the engine felt as if it could do the flight all over again quite easily.

The lecture concluded with the exhibition of a number of slides illustrating incidents which occurred during the flight.

There was no discussion.

At the instigation of the CHAIRMAN a hearty vote of thanks was accorded to the Lecturer.

VICE-MARSHAL SIR VYELL VYVYAN, in proposing a vote of thanks to the Chairman, said: "I do not think, as regards the future of civil aviation and other activities in the air, we could have a better representative than the Secretary of State for Air, particularly in view of the fact that Lady Maud Hoare and the Chairman are going to open the air route from Cairo to Karachi in a week or two's time and then fly from there to Delhi. It will be an epoch-making event, because it will extend the air communications of the world."

The resolution of thanks was carried by acclamation.

THE CHAIRMAN, in reply, said: "I am very much obliged to you for your kind vote of thanks. I have certainly taken to heart many suggestions that have occurred to me during Wing Commander Pulford's lecture for the journey we are going to make in a fortnight's time, and I hope it will be just as successful as his has been."

It may, however, be asked what is the use of all this bookish theory? "I have," continued Pulford, "not won silver cups, although I have written a book. It would certainly be worse than useless to read these lectures and articles in order only to obtain a superficial show of knowledge. But it would be impossible for the power of forming independent opinion and judgment on which all right action depends, not to be developed. If the pages are read in the right spirit - for instance, Lord Grey suggests that 'the study of war in all educational institutions should be brought to the point of bringing home to each generation what modern war really means, in order that we may have, in succeeding generations, a public opinion which understands that it is to the interest of nations that they should avoid such things as the last war.' But here, the reader may well ask himself, can fear drive out war? What does history say on the subject? Again, nobody who has seen war, who, on the one hand, has felt its huge stirring excitement, and on the other has known it horror, can be under any illusion that war is not a dreadful thing."

"The Study of War for Statesmen and Citizens" - Lecture delivered at the London University, 1930. Edited by Major-General Sir George Adam, K.C. H. Longmans (Green and Co. Ltd.), 1931, 12s. 6d.

THE STUDY OF WAR

A COMMENTARY¹

By MAJOR-GENERAL SIR W. D. BIRD, K.B.E., C.B., C.M.G., D.S.O.

STATESMEN and citizens, including among the latter those who are serving in the armed forces, should be grateful to Major-General Sir George Aston for having rescued from the oblivion into which the best lectures necessarily soon fall the very interesting and instructive series that are collected in "The Study of War for Statesmen and Citizens." It is seldom that so comprehensive a view can be taken in one volume of what he terms the business of war; for within these pages the reader is given the opinions of a statesman, Viscount Grey of Falldon, those of a great writer, Sir Charles Oman, those of high naval, military and aerial experts, those of Brigadier-General Hartley, an authority on military chemistry, and those of Mr. G. F. Bridge. Every sailor, soldier or airman then, should apply his mind to a perusal of this volume if he would know the business of war; and as Carlyle remarked, "not knowing it, is he not of all solecisms in this world the most flagrant?"

It may, however, be asked what is the use of all this bookish theory, what have "continual plodders ever won save base authority from other's books?" It would certainly be worse than useless to read these lectures and articles in order only to obtain a superficial show of knowledge. But it would be impossible for the power of forming independent opinion and judgment, on which all right action depend, not to be developed if the pages are read in the right spirit. For instance, Lord Grey suggests that "the study of war in all educational institutions should be brought to the point of bringing home to each generation what modern war really means, in order that we may have, in succeeding generations, a public opinion . . . which understands that it is to the interest of nations that they should avoid such things as the last war." But here, the reader may well ask himself, can fear drive out war? What does history say on the subject? Again, nobody who has seen war, who, on the one hand, has felt its large alluring excitements, and on the other has known its horrors, can be under any illusion that war is not a dreadful thing.

¹ "The Study of War for Statesmen and Citizens"—Lectures delivered at the London University, 1925-26. Edited by Major-General Sir George Aston, K.C.B. (Longmans, Green and Co., Ltd.) 10s. 6d.

Yet Mr. Bridge gravely reminds us that "wrong and injustice are worse than war"; and that, "if the day comes when nations are content to submit every dispute, whatever its origin, to the decision of a court, it may be, not that the world has got better, but that men have become meaner and baser, because there is nothing that they hold dearer than life."

In every generation a school of thought exists that impatiently wishes to disregard the experience of the past and to hurry, without its guidance, into untried paths. There is of course something to be said for this attitude, since it is certainly not wise to be too ceremonious and traditional. But Sir Charles Oman gives very forcibly the other side of the question, together with a defence of the theory that it is not inevitability but great men who direct or influence the current of events. And here again there is scope for thought.

There is just as much food for meditation in the lectures of the fighting men. Sir George Aston pleads first for the study of war, with a view to its prevention, but until this is effected he gives the good counsel that war must also be studied so that it may be waged with success. And the reader is set thinking again by the fact that all of the lecturers, speakers and writers deal with war in what may be called the unregenerate frame of mind of the era before the last struggle, while the League of Nations and its influence are left out of consideration.

Vice-Admiral Sir Herbert Richmond is both eloquent and practical. The object of war is to compel the enemy to compliance; and "compliance in the long run is compelled by the imposition of hardship." But the reader may wonder whether in the Seven Years' War the French, as he suggests, were in fact not subjected to such pressure, likewise the Russian people in the Russo-Japanese War. The soldier also, if he does not know who they were, may be spurred by the sailor's familiar mention of Maillebois and Hideyoshi to follow their careers; and, having done so, he may come to the conclusion that the Chinese army had as much to do with the retreat of Hideyoshi's army from Korea as the Korean navy. Admiral Richmond, in addition, gives a lucid, and to the military mind convincing, statement of the orthodox doctrines of sea-power, and of the functions of the capital ship—"so much derided by those who fail to appreciate its true significance"—and the latter may with advantage be compared, by readers who are still in doubt on the matter, with the opinions of those who confidently assert that the day of the capital ship has gone.

It may be a surprise to some to learn from Major-General Sir Edmund Ironside's plain statement "of the task which faces the British military authorities" that "the size of the Regular Army in no way depends upon our relations with other Powers"; that the Regular foreign garrisons are the covering forces, and that the Territorial Army forms "the method of expansion of the Regular Army." And his remark

that the "men of the Continent seldom fight well outside their own countries," may arouse a desire to endorse it from historical research.

Air Vice-Marshal Brooke-Popham's beliefs on the influence that is to be exercised by air power on the conduct of war are certain to cause reflection. Nevertheless, whatever alarm may be aroused when considering his views, it will probably be allayed by General Hartley's comment that "Like all weapons gas has its limitations"; and that "used at the right place and moment and in adequate amount it offers brilliant possibilities, but theoretical victories might be won with other weapons on the same assumptions." The airman thinks that "landing on a hostile coast in face of air opposition is impossible"; but Admiral Richmond, while admitting that "we may be content to entrust command of the sea in the vital locality to that part of the flotilla which flies," emphasises that "this is a highly unprofessional way of arriving at a decision . . . it assumes a single operation—a straightforward attempt to push across an intervening water. Such things are not done in war—except by ignorant people. Diversions are introduced, feints are made, superiority at the decisive point is worked for. . . . It is not impossible that so large a flotilla [in the air] may be maintained as to provide for everything; but whether this would be an economical use of either money or force is questionable." Landings did not come within the scope of General Ironside's lecture; but unless soldiers still have faith in the value of diversions, smoke screens and similar devices, the opinion may be hazarded that Britain's power of striking with effect has suffered some curtailment.

It is said that there can be no liberty of thought unless those with new thoughts are prepared to unsettle things that have been settled recently as well as things that were settled long ago, and that variation is essential for progress. Variation, therefore, is to be expected in the opinions of the experts, and progress should result from it—not confusion and despair. For instance, in the statement approvingly quoted by General Ironside from the Field Service Regulations it is laid down that "War can be brought to a successful conclusion only by the defeat of the enemy's armed forces and the destruction of his powers of resistance"; but Admiral Richmond points out that: "Blake's fleet arrested the passage of the bullion at Santa Cruz . . . Unable to pay her armies the (Spain's) invasion of Portugal came to a standstill, and Portugal was saved on the brink of disaster." Air Vice-Marshal Brooke-Popham states that: "To gain complete control of sea communications necessitates destruction of the enemy's main fleet." Admiral Richmond discriminates, however, between the "immediate function of overcoming the armed force," and the "ultimate function of controlling the sea. To exercise control, the force of the vessels exercising it must be greater than that of the users of the sea—the trading and transporting vessels—which it is necessary to master, even though temporary armaments should be fitted, and vessels in greater number should have to be dealt with."

General Ironside cannot see "two nations each assailing (from the air) the other's economic resources and seeking by a species of reduction of *moral*, by intimidation and attrition generally, to bring the enemy to his knees . . . it is for us . . . to meet them (the enemy's airmen) over their home bases . . ." Air Vice-Marshal Brooke-Popham believes, however, that man's "brain is clogged with two dimensional instincts and traditions"; and he adds that if "we can bring about continual dislocation of that normal life their position will become so intolerable that a people will submit to any conditions of peace." And he also points out that "fighting in the air on a large scale only takes place by accident or by mutual consent"; but so, it may be interjected, for that matter, does, and always has to a large extent, fighting on the sea. Whatever may be our views in regard to the other differences of opinion, the divergence in respect of the policy of intimidation is surely an excellent subject, first for the research that is advocated by Sir George Aston, then for independent thought. In the last resort it is the peoples, or the directing classes of the peoples, who manage wars, not the soldiers, sailors and airmen; and the basis, therefore, for the solution of the problem is to be found in ascertaining how the peoples are likely to react to mutual attempts at the dislocation of their normal methods of living, and what their demands will then be. If the evidence of recent wars is inconclusive in this matter, it may yet be possible to arrive at some conclusion by studying the psychological effects of the primitive methods adopted in struggles between tribes, cities and urban republics in the past. For human nature has changed little, if at all, through historical times and is likely to re-act to physical fear and brutal forms of compulsion to-day, much as it did in the past. The methods of creating fear have changed, but their effects on humanity will probably be much the same.

Minds having been cleared by this process of research, strategy can be planned on firmer premises than those provided by a zeal based mainly on imagination rather than on historical knowledge, or a conviction, however strong, that does not rest on such a sure foundation. Hence the urgent need for study.

THE ARMY FRANCE REQUIRES

On 1st January, 1921, there appeared in the "Revue des Deux Mondes" an article entitled "The Army we Require." On 1st November, 1926, this was followed up by another anonymous article on the same subject. The intrinsic value of these contributions is such as to invest the following summary of the more recent article with more than usual importance.—EDITOR.

THE system of defence of a country like France, always adjacent to very powerful neighbours, is in reality complex. It is necessary to complete it with many other measures equally indispensable; and if, in this system, the two conditions—the existence of an army and its proper organization—are essential, they are far from being all sufficing. In order that the army, on the outbreak of war, may be ready to oppose enemy depredations in the frontier regions, and that it may subsequently concentrate in sufficient strength to stop the invasion of enemy armed masses, a barrier is necessary. The frontier must be fortified, especially where it is not marked by a natural obstacle. This necessity involves works which require a long time to construct. In their execution the degree of proximity to the danger must be taken into account, as also its nature. Without taking into account gas attacks, the populations of the frontier regions are exposed, from the first days of the conflict, not only to the incursions of the enemy, but also to aeroplane bombardments, which an imposing commercial aviation renders formidable and even alarming. Therefore, besides fortification, it is necessary to include special precautions to guard against this danger. Finally, whatever part of the defensive system is under consideration—fortifications, anti-aircraft defence, covering forces or field army—its efficiency is solely dependent on the armament allotted thereto.

(i) *The Army on a war footing.*—Up to the present France has been principally occupied in recruiting men, instructing them, training them professionally, providing them with officers and N.C.Os., then sending them into the field. She remained faithful to these traditions, adequate in their time. Thus it was at Valmy: it is no longer so to-day. Formulæ grow obsolete through the evolution of civilization; the truth contained in them becomes in some cases merely paradoxical. The volunteers of 1792 armed themselves with lances, pikes, rifles, scythes, but above all with a very definite idea, a resolute will and stern energy. They rushed to the frontier and saved their country. The will of a

people came into action interpreted by the spirit of its soldiers ; the strength of their feeling, supported by the entire resources of the country, led to victory. But the resources of to-day comprise both science and industry, and these must be taken into consideration.

In the days of primitive ballistics, rudimentary firearms, lacking accuracy, range or rapidity of fire, the *arme blanche* retained all its prestige ; the combatants could see each other and fought hand to hand ; the moral worth of the soldier was the preponderant element in the struggle. Armament counted very little. Napoleon, better than anyone, understood the transformation effected in war by the French Revolution, the possibilities opened by the *moral* worth of his soldiers. Better than anyone during the period, he worked up the "soldier spirit." On the field of battle, on the other hand, he carried out the art of utilizing the *number* of these soldiers by appearing with superior forces at the decisive point. But if he prepared the phase of the battle he wished to produce with these effectives by employing hitherto unheard-of masses of artillery, it was because he also understood how to demand from *matériel* all the effort of which it was capable. After him, science and metallurgy, being still in their infancy, were unable for a long time to bring about any great transformation in armament or to make obvious the errors committed in misunderstanding the conceptions of the master. The moral worth and the number of soldiers remained, for more than half a century, the preponderating factors of victory.

This fundamental but abstract idea should have ceased from 1860, when science and industry began to place at the disposal of the military and conquering power, Prussia, an armament which was continually being improved and increased. Evolution in research, production and development of *matériel* power in France was very slow, and allowed the Prussians to steal a march on her with rifles and breech-loading guns, as later with heavy artillery and aviation, without mentioning the proportionate increase in the number of these weapons. Even in 1913, France prepared for the struggle, strictly faithful to the formula of 1792. She increased her effectives with the colours by reintroducing the three years' service at the cost of what sacrifices and expenditure ! She also increased, by an intensive military education, the *morale* and professional efficiency of the combatants. But the deficiencies in *matériel*, machine guns, field artillery, heavy artillery, aviation and means of inter-communication could not be so rapidly replenished. The number of guns in an army corps was small, and the reserve divisions were incompletely armed and equipped. The principle of numbers and the moral worth of soldiers was still the first and the last word of French doctrine.

Thus in 1914 she entered the struggle inadequately armed, equipped and supplied, but with *morale* superior to that of 1792. The consequent sacrifices proved heavy, sometimes shaking the *morale* of the fighting soldier and at times baffling the Higher Command. It became necessary to manufacture, in unheard-of quantities, a formidable *matériel*, to

discover new methods of attack and defence: in short to organize side by side with large manufacturing centres, establishments for important and varied studies. On the day that the French soldiers possessed a sufficiency of really modern *matériel*, trained by experience, they adapted their "groupements" and units to its employment, and trench warfare ended. It was a new and definite proof of the impotence of the combatant who has only his courage and personal weapons against the crushing effects of *matériel* produced by science, when concentrated in a powerful armament.

On the modern battlefield, *matériel* is the primary condition of the efficiency of the combatants, however excellent they may be. Its quality, nature and composition are the bases upon which the organization of an army must rest in order to attain victory.

Furthermore, the preparation of this army in peace must include, under a very efficient central administration:—

- (1) Establishments both for the study and research of these *matériel* means.
- (2) Fully maintained manufacturing centres.
- (3) Such groupings of troops or units, as will be capable of maintaining and developing, in the corps of officers, the combined employment of the different *matériel* for attack or defence; of training soldiers for their duties in war in the employment of one or more weapons; also capable, by the calling up of reservists and the supply of *matériel*, to create fresh fighting units.

An army cannot be ready, unless these conditions are satisfied.

In France, with its reduced population, this evolution in warfare, which tends to economize man power by a greater employment of *matériel*, must now be taken into serious consideration. The question of the necessary *matériel*, its employment under all circumstances, and the types of *matériel* to be studied and manufactured when a crisis is at hand with an industry which is always limited, is consequently paramount.

If up till now the assembly of an increasing number of combatants, together with the laws dealing with the recruiting and organization of resources in man power, have been the beginning and the end of military organization, henceforth *matériel*, armament and technical science will assume, among European nations, such importance and produce such modifications in warfare, that fundamental military laws can no longer afford to overlook them. The history of the last war provides far too important lessons on this subject; they cannot be neglected.

Further, at a period when neighbouring States, inspired by different principles, are endeavouring to obtain the disarmament of others, it might be fatal to rely entirely on the strength of peace effectives. It may be possible to reduce them, compensating this reduction by their

organization and armament, as well as by the methodical preparation of reserve units.

In 1914, France entered upon war with a magnificent army, inadequately supplied with *matériel*, with few machine guns and an insignificant number of heavy guns. The 75 mm., an excellent gun, had to satisfy all requirements. Only a limited number, however, existed; the same applied to ammunition. Again, tactics were defective. The powerful effects of modern armament had been barely realized. The results were terrible casualties, too costly victories.

On the other hand, from 1917, manufacture fully assured the supply of the *matériel* the need of which had been so cruelly felt. The Higher Command and the troops had learnt their employment from war experience. The road to victory had been opened up.

France entered the war in 1914 with—

Men.	Light automatics.	Machine guns.	Tanks.	75 mm. guns.	Heavy guns.	Aero- planes.	Cars.
2,500,000	0	2,000	0	3,900	300	200	9,000

In 1918, in order to attain victory, the following were required:—

2,800,000	47,000	18,000	2,500	5,600	5,200	3,200	88,000
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This increase affected heavy, medium and small calibre armament, the means of observation from the air, and new means of attack, such as tanks. Telephonic and wireless communication *matériel* and transport also must be included. Finally, all combatants were provided with gas masks, and followed by organizations for research and investigation of the measures needed for protection against gases. The struggle by fire had been duplicated by chemical warfare; a new weapon and a new technique had been added to those required by the struggle in the air and on the ground.

Thus history leads to definite conclusions as regards European war:

1. An army cannot to-day take the field with impunity without a mass of *matériel*, important both as regards its quantity and its variety, and also without an ample supply of ammunition upon which its efficiency depends.

2. The power of an army increases with the quantity of such *matériel* provided, however, that the proportionate allotment of weapons of all natures is well thought out.

The fact is that fire-power has assumed in war an absolute preponderance at all ranges. It is this fire-power which first of all caused the development of the number of guns and automatic weapons, then the creation of tanks. Finally, it decided the tactics to be adopted. Consequently, cavalry can only fight dismounted with firearms, guns, machine guns or carbines; infantry can only take part if well supported

by artillery; engineers become mixed up in all fighting operations. There is no arm capable of acting independently. Only the co-operation of all arms can produce results. Henceforward the division, which combines them all, must be taken as the basis for the organization of an army. The composition of the division itself must be based on the nature, the number, and the ratio and grouping of the weapons of all calibres, as well as on the machines, and the means of observation and communication recognized as necessary. The primary object of the units of which this division is formed is to ensure the handling and smooth working of this varied *matériel*. The aim of the Higher Command of this formation, which is composed of batches of weapons grouped by calibres or according to their range of action, is to ensure the co-ordinated effort of these different batches.

(ii) *The Division on a war footing.*—The armament to be allotted to the division was and still is what it requires to carry out its allotted task, i.e., to conduct an action from start to finish, except when special reinforcements are allotted to a division if it is given a particularly heavy task.

Troops cannot assault an enemy position by close-range action, unless they have an armament capable of destroying the obstacles on the way, and of dominating, or at least reducing the enemy's fire. The division starts by producing its powerful effects at long range with its guns, then continues at close range with its automatic weapons and finally maintains its effect up to the last minute by protected and armoured weapons.

When a division comes into action, its field artillery must open the way, but against certain stronger obstacles it will be obliged to call in heavier artillery. The enemy will promptly reply with his field artillery, and then with his long range guns, which necessitates our heavy long range artillery coming into line, without which the advance would be checked. But, in this long range struggle, the effect of our artillery, whether field guns, heavy howitzers or long range guns, depends upon the accuracy with which they are brought to bear, hence the necessity of air observation, which verifies the results obtained. Now observation aircraft cannot maintain themselves in the air, unless protected by fighting aircraft.

Finally, all these organizations, troops in front line, artillery of different calibres, observation aircraft, fighting aircraft, whose task is to fight or to watch the enemy, can only operate and still more be directed or kept informed, if they are in communication with each other, and as also with the divisional command and certain of its echelons; hence the necessity of a strong system of intercommunication radiating from the division.

The following tables show the increases recognized as effected in the *matériel* of the French division during the campaign, as well as the improvised transformations which took place in its composition.

SUCCESSIVE TRANSFORMATIONS OF THE DIVISION DURING THE WAR.

THE ARMY FRANCE REQUIRES

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Date.	—	Infantry.				Artillery.				Effectives.	Ratio.			
		Rifles.	Light automatics	M.Gs.	Close support weapons	Tanks.	75 mm.	Heavy howit- zers.	Heavy guns.		Air- craft.	Bal- loons.	Per 100 men.	Automatic Guns. weapons.
1914 Aug.	Organic division	9,600	—	24	..	..	36 (60)	..	..	..	16,000 (18,000)	0.15	0.22 (0.33)	15 25
1916 2nd half.	—	..	216	72	9	..	36 (48)	..	(8)	..	17,000 (18,000)	1.70	0.21 (0.31)	1.24 1.94
1917 2nd half.	..	..	324	108	27	..	36	12	(12)	..	13,200 (15,000)	3.28	0.36 (0.44)	1.11 1.36
31st July.	Flanders, average Inf. Div.	..	324	108	27	..	120	186	..	..	28,000	1.54	1.09	7.15
23rd Oct.	Malmaison, per Inf. Div.	..	324	108	27	..	104	164	..	..	28,000	1.66	1.03	6.20
1918 2nd half.	Organic division	..	405	108	18	..	36	12	(12)	..	13,000 (13,600)	3.95	0.37 (0.44)	9.66 (1.16)
	Division attack.	..	405	108	18	45	120	60	56	60	27,000	1.90	0.87	4.60
	Division defence.	..	405	132	18	..	48	24	28	10	18,000	2.98	0.55	1.86

(d) Each of two divisions	304	76	12	..	48	24	..	10	1
	380				72			300 men.	
	7,200 men.				4,300 men.			2,700 men.	
	Total, 14,500 men.								

(e) For two combined	608	152	24	..	96	48	..	20	2
	760				144			600 men.	
	14,400 men.				8,600 men.			5,400 men.	
	Total, 29,000 men.								

(f) Corps troops	76	144	..	35	48	24	72	35	1
	220				144			600 men.	
	3,100 men.				7,500 men.			4,800 men.	
	Total, 16,000 men.								

This would give a total of an army corps at war establishment of 45,000 men.

Whatever happens, it follows that the formation of a division (and then of an army corps) merely by grouping a certain number of regiments formed *a priori* according to old formulæ and keeping to the armament which each of them brings will not suffice. By the other method we arrive at a powerful organization of the division and army corps, basing them in the organization of the armament recognized as indispensable by war experience, and by thus deducing the number and the composition of the units of which these higher formations should be formed.

On the same principle we shall allot all the weapons of whatever nature, which operate in front line and are employed at close range to the infantry; those which are employed at longer ranges to the artillery; air means of observation or fighting to the air service.

The command of these effectives must also be reorganized on a similar logical basis.

(iii) *The Army on a Peace Footing.*—During the last war, France formed about 100 divisions. In a future European war, taking into consideration the power of her neighbours, this is the figure which her population would enable her to attain, and at which she should aim. There can be no question of putting all these divisions into the line at the outset, but the nation could not take the field with less than forty divisions powerfully equipped. It is possible to obtain this by demanding

from each of our twenty military regions the immediate provision of two divisions and the corps troops for an army corps.

One of these divisions should be kept up on a peace footing to a strength which would suffice to maintain suitable military employment and training, and to ensure quick mobilization; the other would be a skeleton division, generally speaking attached to the first, and would mobilize by duplication of the latter.

The division maintained in peace and called upon to provide the cadres of the second and certain corps units, would comprise, in *matériel* and effectives :—

Infantry.				Artillery.			Air Service.		Various.
Light automatics.	M.Gs.	Close support weapons.	Tanks.	75 mm.	Heavy howitzers.	Heavy guns.	Air- craft	Bal- loons	
377	113	12	20	72	36	36	30	1	..
490				144					
7,000 men.				6,000 men.			400 men.		1,600 men.
Total, 15,000 men.									

The *matériel* enumerated above only comprises *matériel* actually issued; the mobilization *matériel* of the division to be duplicated, and of the army corps units, as well as all further ammunition required on the outbreak of war, must also be stored in peace.

The division on a peace footing will thus include a combination of units and an organization of command as follows :—

1. Infantry.

3 regiments of 2,300 men each comprising :—

3 battalions of 3 companies and 1 machine-gun company,
1 heavy machine-gun company, 1 company of close support
weapons, and a tank company for one of the regiments.

2. Artillery.

1 75-mm. regiment of 4 "groupes."
1 75-mm. regiment of 2 "groupes" carried in lorries.
1 heavy (howitzer) regiment of 3 "groupes."
1 heavy (guns) regiment of 3 "groupes."

3. Air Service.

2 observation squadrons.
1 pursuit squadron.
1 balloon company.

4. Other arms.

1 cavalry "groupe."

1 anti-aircraft artillery "groupe."

2 companies of sappers and miners.

1 telegraph company, etc.

5. Administrative Services.

With these forty first-line divisions providing twenty army corps, supported by fortifications, France would have the means, not to undertake an immediate general offensive, but to protect her territory from invasion until the arrival of other divisions, drawn from Algeria and elsewhere, in addition to the mobilization of all French resources.

France in Europe must maintain an army on a peace footing of 300,000 to 350,000 men, including a few cavalry divisions and other special formations. The army must be raised both by compulsory service as well as by the enlistment of regular soldiers, the latter being allotted to units and not to administrative services.

Finally, the requirements of the colonies and protectorates must be examined separately.

Such must be the basis of a recruiting law which does not leave the defence of the country to the chances of improvisation.

After the effectives to be maintained, as well as their distribution and training, have been laid down, the necessary and adequate length of service will be fixed automatically. The law of cadres will stand out as an obvious conclusion and, in turn, will determine the number of officers of the active list required to maintain the division in peace time, enabling them to ensure the duplication of units anticipated on mobilization, as well as preparation for the mobilization of further divisions.

It would be dangerous to legislate on the length of military service, the cadres and effectives, the number and type of the regiments, without having taken into consideration beforehand the new conditions of war in Europe, the importance and variety of modern armament, and without having determined and established the nature and composition of an army capable of answering the requirements of such a struggle. Again, it would be dangerous to confine re-organization to grouping the remnants of institutions, often very obsolete, by adjusting them more or less haphazard.

It is an actual fact that in modern forces effectives are not everything. *Matériel*, and above all, armament, play an important rôle. For this it is not enough to keep them in store. The troops should have this armament constantly with them, so that the soldier learns how to handle it, the officer to employ it, the commander to direct it, to utilize it to its full power and with all its types. Military laws cannot neglect this necessity.

In any case, any legislation which deals systematically with the employment of resources in man-power without combining it with the working and employment of matériel, which is becoming more and more necessary and more and more important, would risk the formation of an army which is misleading, and would lead the country to a first effort, that of the calling-up of men, without any certainty of seeing the second followed up, that is, the assured provision and the employment of the matériel, as well as the constitution of the indispensable stocks of ammunition. It would thus risk preparing for the country merely a rampart of human bodies, always doomed to sacrifices, however sanguinary and costly.

NOTE.—The foregoing article should be read in conjunction with that on "The Organisation of the French Nation for War," p. 376 of this JOURNAL.—EDITOR.

SIGNAL COMMUNICATIONS IN WAR

By MAJOR R. CHENEVIX TRENCH, O.B.E., M.C.

On Wednesday, 15th December, 1926, at 3 p.m.

MAJOR-GENERAL A. R. CAMERON, C.B., C.M.G., Director of Staff Duties, War Office, in the Chair.

THE CHAIRMAN introduced the lecturer, drawing attention to the fact that he was a winner of the Gold Medal of the Institution and also a winner of the Bertrand Stewart Prize Essay.

LECTURE.

SIGNAL communications are a very old branch of the profession of arms, and in modern war they present a problem of outstanding importance and interest. It is, moreover, a problem as yet unsolved. A commander to-day by sea, land or air disposes of powers unimagined a few years ago. These powers lie ready to his hand, but how far he is able to make full use of them is another matter. The answer depends upon his means of control; that is, his signal communications. Science has of late added prodigiously to our armoury, but she has scarcely shown us at the same time how to control and co-ordinate our new weapons. Striking power, to-day, is out-distancing the means of control and the problem of signal communications is how to restore the balance.

The subject offers a bewildering choice of material for a single lecture, and some day, no doubt, a graduate of the Imperial Defence College will paint for you with a broad brush the picture of signal communications as it appears to a combined staff of the three Services. But however far the question may be reduced to some such common denominator, there must always remain for each Service its own problem. That problem is to provide its own communications in its particular element of sea, land or air; and further to communicate with the sister Services co-operating in elements which are strange to it. To-day I am going to discuss the problem from the soldiers' point of view. I shall give first a short account of the Army's own intercommunication system, next an outline of signal co-operation with the Navy and the Air Force, and then some aspects of future development. It must be understood that I am referring to mobile operations throughout, as opposed to the

signal system which grows up on a long established front. Finally, I want to say a word about Imperial Communications.

Well into the latter half of last century generals commanded from the saddle and their orders were borne by galloper. Since those days three factors have arisen to change the problem of control. The first is that range and fire power have so developed, that close order in the face of the enemy is no longer possible. Secondly, the modern commander disposes of aircraft, tanks and armoured cars, machine guns and long range artillery, and all these utterly dissimilar elements must work on a concerted plan to help the infantry. Thirdly, the material wants of a modern army are so many, and the rearward services so extensive, that the business organization of the fighting machine makes as great demands on signal communications as does the actual conduct of battle. Modern demands are so exacting that the Royal Corps of Signals has been called into being to satisfy them. It is the latest child to leave that nursery of warlike sciences, the Corps of Royal Engineers.

In describing how the problem is dealt with, I propose first to review the various means of communication and then to take as a definite example the Division, the basis of field army organization, and show how our means are applied to link its diverse parts into one fighting body.

First of all then, our means of intercommunication are four, namely:—

Message carrying by despatch rider, runner or orderly ;

Visual telegraphy ;

Line telegraphy and telephony ;

Wireless telegraphy and telephony.

None of these can stand alone ; they must be co-ordinated so that each by its special capabilities makes good the weak points in the others. Discussing each in turn we may say that message carrying, the oldest method of all, remains one of the most important. In the confusion of the infantry fight or with cavalry on the move other means are frequently impossible, while in the most highly organized system the despatch rider is indispensable. His normal role is to carry bulky correspondence which would otherwise block the telegraph, while in an emergency he can often go where all other means have failed. On the other hand, he may be captured or killed with despatches on him, or his use may be forbidden by a hostile population or by natural obstacles.

The next method is that of visual telegraphy. In countries where the sun shines the heliograph is invaluable, while at home visual telegraphy has been given a new lease of life by the invention of the daylight electric signalling lamp. But this method is slow ; in close country or thick weather it is unemployable, and we have still to find out how it will be affected by the increased use of smoke screens in battle.

Thirdly, there is line communication, which is beyond doubt the best method of all when obtainable. Perhaps its greatest tactical advantage is that it puts commanders in touch by telephone. It carries much more traffic than does visual or wireless and it is comparatively secret. Most important of all in an imperial emergency this method has the backing, in men and material, of a great civil industry. The drawbacks are that a great weight of material has to be carried in the field. The lines take time to lay, while if you are caught by an unforeseen development—and they are generally unforeseen—you may find your labour lost and your resources committed. Worse than all, lines may be cut in more ways than I like to think of: by shell fire or bombing, raids, enemy agents, unfriendly inhabitants, bad weather, and not least by our own tanks and transport.

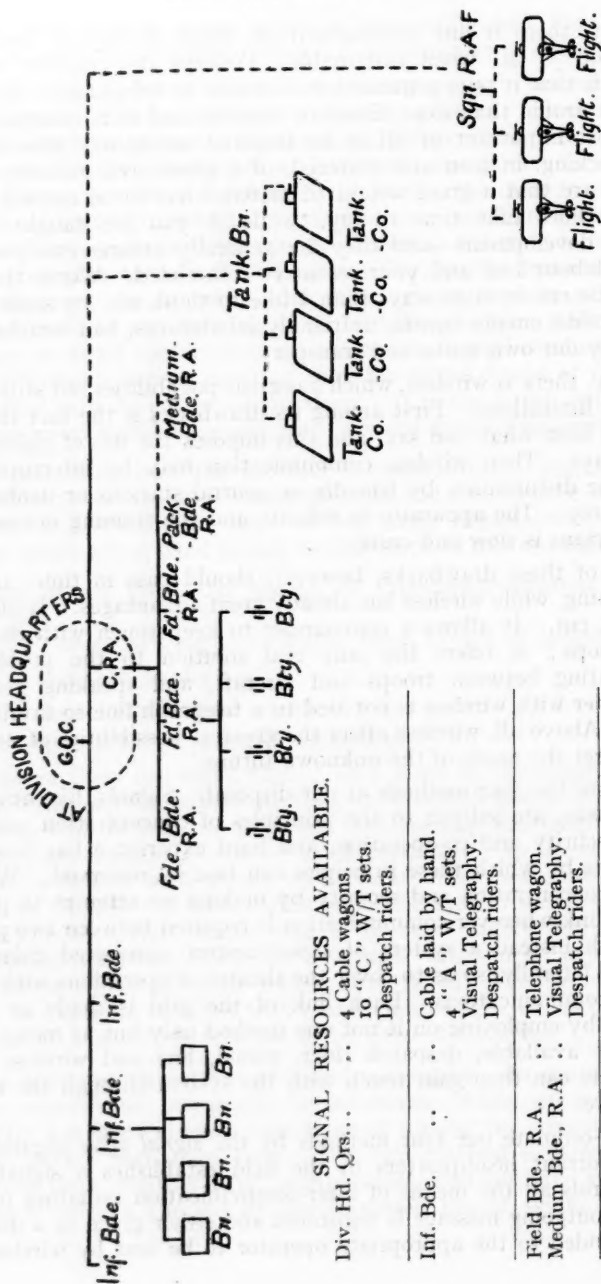
Finally, there is wireless, which has great possibilities but still suffers from great limitations. First among its drawbacks is the fact that the enemy can hear what you say, and this imposes the use of cipher with all its delays. Then wireless communication may be interrupted by atmospheric disturbance, by friendly or neutral stations or deliberately by the enemy. The apparatus is delicate and the training of operators and electricians is slow and costly.

Many of these drawbacks, however, should pass in time, and are in fact passing, while wireless has already great advantages. It offers no lines to be cut. It allows a commander to keep touch with detached mobile troops; it offers the only real solution to the problem of communicating between troops and aircraft, and speaking generally a commander with wireless is not tied to a telegraph line so firmly as in the past. Above all, wireless offers the greatest possibilities of development to meet the needs of the unknown future.

Such are the four methods at our disposal. Signals, like any other branch of war, are subject to the principles of concentration, economy of force, security and co-operation, and hard experience has taught us certain rules by which these principles can best be observed. We seek economy, concentration and security by making no attempt to provide a separate link wherever communication is required between two points; we establish instead a system of *signal centres*, connected from front to rear and laterally, so as to cover the theatre of operations with a grid of signal communications. Each link of the grid is made as secure as possible by employing on it not one method only but as many of the four as are available, despatch rider, visual, line and wireless. Any headquarters can then gain touch with the system through the nearest signal centre.

We co-ordinate our four methods by the *signal office* organization. Every important headquarters in the field establishes a signal office which controls all the means of inter-communication radiating from it. Here each outgoing message is registered and either given to a despatch rider or handed to the appropriate operator to be sent by wireless, line

CHAIN OF COMMAND IN A DIVISION



Dotted lines - - - show non-divisional units attached to the Division.

Message dropping and picking up.

or visual telegraphy; and here all incoming messages are distributed. A higher formation is responsible for providing communication with its subordinate headquarters, so that the whole system works downward from rear to front.

So much for our methods and principles: we must next see how the system works in that typical example, the division.

COMMUNICATIONS OF A DIVISION.

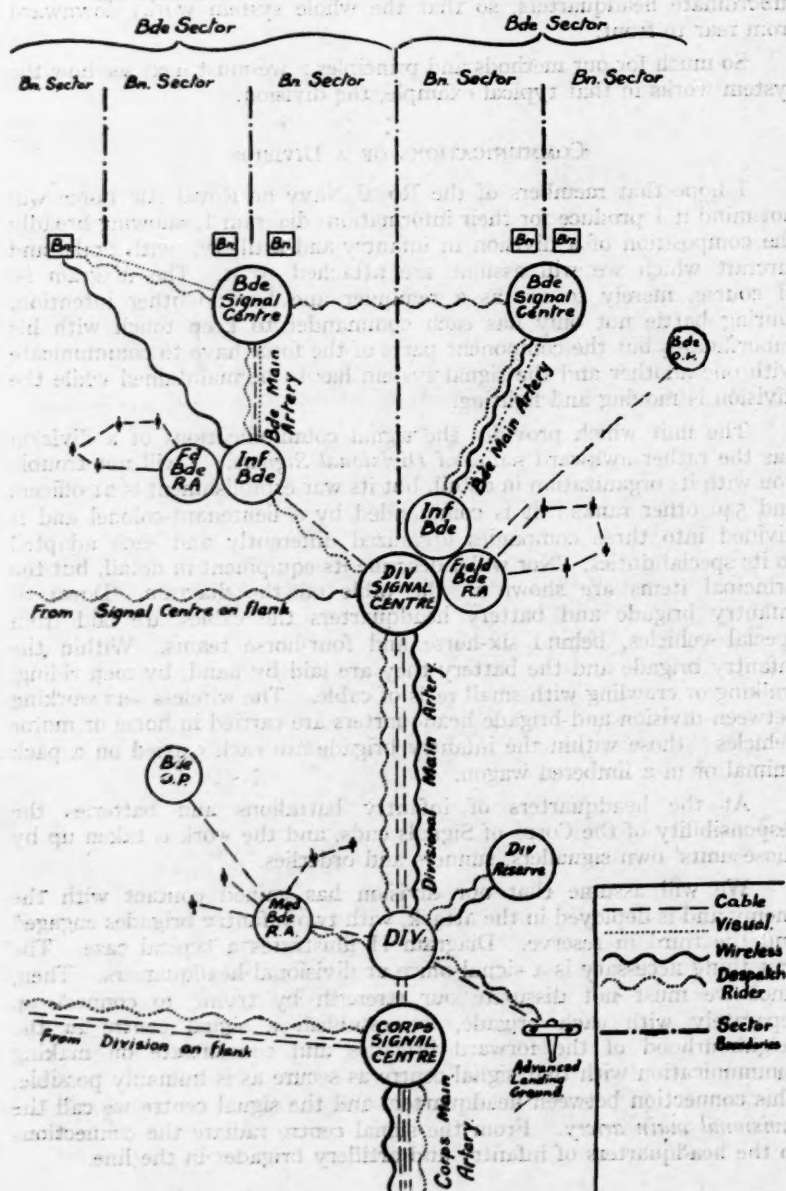
I hope that members of the Royal Navy or Royal Air Force will not mind if I produce for their information diagram I, showing broadly the composition of a division in infantry and artillery, with tanks and aircraft which we will assume are attached to it. The diagram is, of course, merely to act as a reminder and has no other intention. During battle not only has each commander to keep touch with his subordinates but the component parts of the force have to communicate with one another and the signal system has to be maintained while the division is moving and fighting.

The unit which provides the signal communications of a division has the rather awkward name of *Divisional Signals*. I will not trouble you with its organization in detail, but its war establishment is 21 officers and 540 other ranks; it is commanded by a lieutenant-colonel and is divided into three companies organized differently and each adapted to its special duties. Nor will I describe its equipment in detail, but the principal items are shown in the table on the diagram. Down to infantry brigade and battery headquarters the cables are laid from special vehicles, behind six-horse and four-horse teams. Within the infantry brigade and the battery they are laid by hand, by men riding, walking or crawling with small reels of cable. The wireless sets working between division and brigade headquarters are carried in horse or motor vehicles; those within the infantry brigade are each carried on a pack animal or in a limbered wagon.

At the headquarters of infantry battalions and batteries the responsibility of the Corps of Signals ends, and the work is taken up by those units' own signallers, runners and orderlies.

We will assume that our division has gained contact with the enemy and is deployed in the attack, with two infantry brigades engaged and the third in reserve. Diagram II illustrates a typical case. The first thing necessary is a signal office at divisional headquarters. Then, since we must not dissipate our strength by trying to connect up separately with each brigade, we establish a signal centre in the neighbourhood of the forward brigades and concentrate on making communication with that signal centre as secure as is humanly possible. This connection between headquarters and the signal centre we call the *divisional main artery*. From the signal centre radiate the connections to the headquarters of infantry and artillery brigades in the line.

DIAGRAM II

SIGNAL COMMUNICATIONS IN A DIVISION

You see that in this instance we have up the main artery two cable lines as well as wireless and despatch riding, while the brigades which are off the artery have cable and despatch riding to the signal centre. The signal centre gains touch by despatch rider with the signal centre to the right or left, and, if movement ceases for a few days while preparing for a big attack, then this lateral communication may be reinforced by cable or wireless. When brigade headquarters contemplate a move forward, the division pushes forward a new signal centre and extends the main artery.

Within the infantry brigades the same general plan is followed, but with the brigades of artillery we find different conditions; the batteries are generally so placed that a signal centre would not help us and cable must be run out to them all.

Behind the divisions the same process is followed by corps and armies, with the difference in detail that the ground cables are gradually replaced as the lines extend backwards by overhead wires. Then, as the divisions push forward, the formations in rear take over and amplify the signal system. To this end each formation, Corps, G.H.Q., Lines of Communication, etc., has its own signal unit organized for its special needs. Superimposed on the whole network is the air defence signal system for the service of the anti-aircraft guns and searchlights.

I have tried to give a general idea of the lines on which the Army attacks its problem of inter-communication. The next part of the lecture deals with inter-Service co-operation, and I will begin with communication between troops and aircraft.

The army co-operation squadron allotted to our division would normally have two aeroplanes up during battle; one, called the *artillery reconnaissance patrol* to observe for the guns and help them to range on their targets; the other, called the *close reconnaissance patrol*, to observe the movements of our own and the enemy's troops.

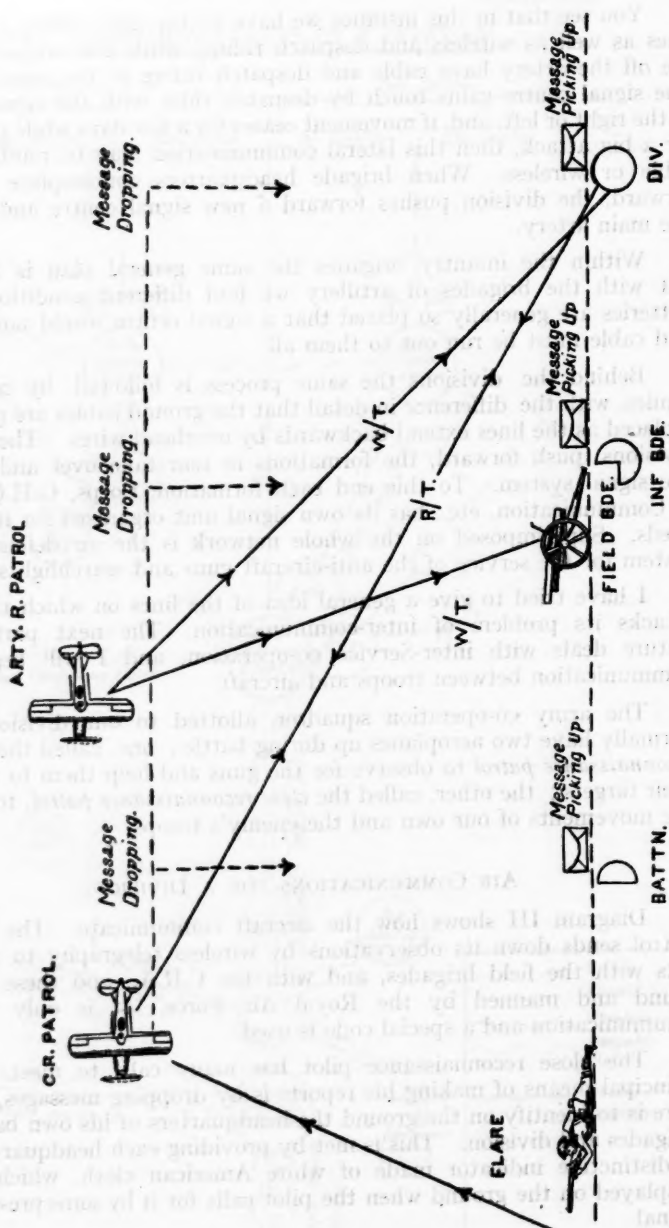
AIR COMMUNICATIONS FOR A DIVISION.

Diagram III shows how the aircraft communicate. The artillery patrol sends down its observations by wireless telegraphy to receiving sets with the field brigades, and with the C.R.A., and these sets are found and manned by the Royal Air Force. It is only one-way communication and a special code is used.

The close reconnaissance pilot has many calls to meet. As his principal means of making his reports is by dropping messages, his first care is to identify on the ground the headquarters of his own battalions, brigades and division. This is met by providing each headquarters with a distinctive indicator made of white American cloth, which can be displayed on the ground when the pilot calls for it by some pre-arranged signal

Diagram III

AIR COMMUNICATIONS FOR A DIVISION



He is also in radio-telephonic communication with divisional headquarters, where the apparatus is in a motor vehicle found and manned by the Royal Air Force. It provides two-way communication so that the divisional staff can give the pilot instructions or ask him questions. You will notice that both here and with the artillery patrol both ends of the link are in the hands of the Royal Air Force, so that there is no divided responsibility.

A battle is a confused business, and what a commander often wants to know more than anything else is how far his most advanced troops have advanced. These troops can signal their position to the close reconnaissance pilot by some pre-arranged signs, such as lighting flares, either at a time fixed beforehand or in response to a special call from the aeroplane. This process sounds simple enough, but in practice half the men carrying flares may be casualties, and the rest utterly weary at the end of a day's fighting and involved in its inevitable confusion. To give good results this method demands the highest discipline and training.

The last service which the pilot can render his comrades on the ground is to carry messages for them when other means have failed. Isolated bodies of troops can send very short code messages to aircraft by means of a special signalling panel, but the more general way when the ground allows it is for a written message to be tied to a cord slung between two sticks. The pilot flies low, grapples the cord and bears off the message to drop on its destination.

Finally, a pilot must make a full report as soon as he lands, and there must be some means of getting him into touch with divisional headquarters without delay. This is generally difficult, and the best way is to seek an advanced landing-ground so close to divisional headquarters that a direct cable line can be run to it.

The Royal Air Force, of course, needs ground communications for its administration just as much as the Army; it provides its own wireless, but the Army is responsible for providing what is necessary in the way of despatch riding and line communication.

SIGNAL CO-OPERATION WITH THE NAVY.

To illustrate co-operation with the Navy, we will take the case of an opposed landing. As soon as the operation has been initiated and sufficient ground made good, a signal office is established on each beach to form a signal centre for the sea, land and air forces of the attack. Here the officer commanding the covering troops and the naval artillery directing officer set up their headquarters, and signal communications in two directions radiate from it. Landward there is such a system as I have already described; seaward there is communication to the headquarters of the three Services, to the bombarding ships, the aircraft carriers and the incoming boats.

As the force gains ground, artillery is landed and later by degrees the army and air headquarters, the base and the administrative services are established ashore. With each phase the signal system develops step by step. The links from the ship to shore, which at first are necessarily by visual, wireless and despatch boat, are reinforced by cable, laid by the Navy, as soon as the ships need no longer keep under way.

In any link of communication between ship and shore, it is a rule that both ends are found, in men and material, by the same Service. The Navy finds the wireless and visual stations working to ships from the beach signal office, while the Army works the ship ends of any cables which are laid. This is the same rule as that in force between troops and aircraft; but, of course, it cannot always be followed, and it is essential for operators of the three Services to be accustomed to work together. I am never likely to forget a critical failure in wireless communication in North Russia between G.H.Q. at Beresnik and the flotilla up the Dvina; a failure due to no technical defects but to the incalculable frailties of human nature, because there was a sailor on one instrument and a soldier on the other, accustomed to different procedures. The Editor of our JOURNAL may remember the incident.

Now co-operation between three independent Services is not a spontaneous growth. It is the child of two parents. The one is goodwill between the Services, the other the staff machinery through which the goodwill operates to produce the carefully worked-out plan. The goodwill happily is always there; the machinery is provided by a *Combined Signal Board*, a body formed by the three senior signal officers with the force, one for each Service. This board not only prepares the signal plans for the combined operations, but concerns itself with communication by cable and wireless with the home country. This brings us into the region of Imperial Communications, which I propose to refer to later on.

The Combined Signal Board at the seat of war is itself the offshoot of the *Wireless Telegraphy and Visual Signalling Board* in London. This is a permanent inter-Service body sitting in peace and war; not only does it co-ordinate signal matters of mutual interest between the Services, but it can present the combined Service point of view, on such matters as wireless, to outside authority. I mention it as an example of existing inter-Service co-operation which is entirely successful.

FUTURE REQUIREMENTS.

So far I have set out a recital of bald facts, an account of things as they are. We come now to the more interesting realm of speculation.

At the beginning I ventured on the statement that the striking power of modern armies was outdistancing a commander's means of control. Let us look at one or two aspects of war to-day. Its outstanding feature is the development of fire-power. Fire has long been the dominant factor on the battlefield, but its rule to-day is absolute.

Infantry cannot go forward against the unsubdued fire of modern weapons and, if a commander would advance, his first care is to provide fire support for his infantry. But should he desire to use his artillery for this purpose, in spite of all its crushing power, he will immediately be faced by the problem of signal communications.

He wants quick and certain communication from the forward infantry to the infantry commander; from the infantry commander to the artillery commander; from the artillery commander to the guns, and from the guns to their observing officers. Of these links the last which provides observation for the guns, is the most vital. At the same time it is the most precarious, for the only effective means to achieve this purpose which we possess to-day is cable, exposed to all the hazards of shell-fire and passing tanks and horses. One of the pressing problems of signals is to make this link more secure; trials are being made of radio telephony, which sounds indeed the obvious solution, but carries its own difficulties.

Your apparatus, for instance, must be light enough for two men to carry across country, it must be strong enough to stand a few falls, simple enough for the private soldier to work in battle and as reliable as an unbroken cable line. It must expose no visible aerial to the enemy. In short, its design offers a flattering scope to the skill of the Signals Experimental Establishment.

Scarcely less important is the link from the forward infantry. From diagram I you will see that their demands for support must come from company to battalion headquarters and from battalion to brigade, generally through the brigade signal centre. It does not seem difficult on paper, yet what infantry officer, with war experience, has not known agonizing delays in getting artillery support. As often as not this is due to no technical breakdown but rather to the casualties, the fog of war and the confusion inseparable from battle. The better the tactical training in the field of brigade and battalion signallers, and the training of commanders of all grades in the use of signals, the less is this kind of delay experienced. Its reduction seems so far to lie rather in this tactical training than in any revolution of technical methods. There is no more pressing problem than this of artillery and infantry communications, and it is not too much to say that the evolution of artillery tactics is held up awaiting its solution. Until it is solved we must continue so often to see divisional artillery split into packets, allotted to infantry brigades and battalions, its power dissipated instead of being concentrated under a single control.

I have dwelt on the fact that the effective use of modern fire-power depends on the state of signal communications, because we are apt to forget it in peace training when fire effect, the merciless arbiter of real warfare, is left to the imagination. I sometimes wonder whether umpires, in judging whether or not an advance is possible for infantry,

might not take as their criterion the state of communication from the infantry to their supporting artillery.

Take next that new arm, the tank. Science has created this monster and endowed it with formidable power and terrific aspect, but she has withheld so far certain finer faculties. The fighting tank is half blind still, and stone deaf, and does not even know you are trying to speak to it. A tank battalion has a signal section of five radio telephone tanks, providing communication between battalion and company headquarters; but within the tank company there is nothing; the sixteen tanks of the company, once launched on their mission, are lost to control until the survivors gather at the rallying point. Tactical handling of the four sections in battle, manœuvre under the control of the company commander, these await the development of a means of inter-communication.

Wireless at once suggest itself and it will no doubt provide the final solution, but there are difficulties. If you are to put wireless gear into a fighting tank, how far are you to reduce its armament to make room? Are the tank crews to add a knowledge of wireless to their present accomplishments? How will you avoid chaotic mutual interference? These are a few of the questions which arise.

As a last example of a modern development which has outrun our means of communication, we will take aircraft. A commander to-day, it is true, has his eyes in the air, but the nerve connecting eye to brain is still rudimentary. We still use the crude method of a pilot flying back in person to drop or pick up a message, leaving his beat to do so. Again, some extension of wireless suggests itself, but even the radio-telephony already provided to divisional headquarters has its limitations, as anyone will realise who has tried from the ground to carry on a running conversation with a pilot in the air. The pilot, moreover, cannot be bombarded with questions or instructions from an indefinite number of people on the ground.

All these problems of control, with their inter-locked tactical and technical considerations, are extraordinarily interesting, but we must not forget a branch of signals which is at least as important as any of them. I refer to regimental signalling, by which a battalion commander exercises control in battle. Battalion signallers are equipped with cable and visual apparatus and are trained on the same lines as the Corps of Signals, so that there is one accepted procedure for dealing with messages throughout the army, from the base to the front line, founded on the practice of the G.P.O. in handling telegrams. Officers at the same time have to observe a uniform procedure in writing messages.

The value of such uniformity is obvious, but it has the defects of its merits when you try to follow it within a battalion in action. Messages there are not dealt with in the comparative quiet of brigade headquarters or the cloistered seclusion of division or corps, but are written in shell-holes and ditches, probably in the rain, in all the confusion of battle and

our modern equivalent for "the thunder of the captains and the shouting"; and they may be signalled by men hungry, exhausted and in the fear of death. No wonder that, when it comes to the point, all your hardly acquired signalling lore so often goes by the board and a runner is sent instead. I think one of the great problems of signals to-day is to simplify the use of visual telegraphy in the battalion.

When the future of signal communication is discussed, one often hears embittered argument on the theme of line *versus* wireless, but there is little really to argue about. An uncut line is better than wireless, while wireless is better than nothing when you cannot have a line or when your line is badly shot up.

The possibilities of wireless are boundless and its use must increase, but to-day it is lines which form the backbone of army signals. Lines alone can carry the volume of traffic; in addition, they allow the telephone to be used at the same time as the telegraph over the same wire, and it is hard to overstate the value of this in allowing an interchange of ideas impossible in the written message. For the future we must be opportunists, refusing nothing which promises to serve us. We must remember that the main drawback of lines—that they may be cut—is inherent, while for all we know the drawbacks of wireless may some day be improved away.

It will be long, however, before radio-telephony can compete with line telephony; for one thing, you cannot encipher a conversation. And this brings us to the question of what is known as *signals security*. If the signaller had only to proceed and send his messages, his work would be simpler than it is. But he can never forget that what he sends is of interest to the enemy. A despatch rider may be captured; a message flashed on a lamp may be intercepted; telephone conversations over a cable line may, under certain conditions, be overheard in the enemy's lines; ground indicators displayed to guide your own aircraft may tell the enemy where your headquarters are; most dangerous of all, the enemy can listen to your wireless.

Signals security deals with all these dangers, and its greatest concern is with wireless. Not only must all except certain classes of messages be enciphered, but the identity of the stations exchanging messages must be concealed. Cryptography, moreover, is a black art, and no cipher can permanently defeat the experts who seek to break it.

Like other problems of signals, this one of security can only be solved by an alliance between the General Staff, the signal officer who does the work in the field and his brother officer or civilian colleague engaged on scientific research and experiment. I will not trouble you with an account of how this harmony is achieved, but it is the foundation of progress.

In the same way the foundation of good signal communications in the field lies in harmony between the General Staff and their Signals.

In all plans the Staff must take signal problems into account, and must take their Signal Officer into their confidence. He, in his turn, must see to it that their confidence is deserved, for his responsibilities are great. If the commander he serves has recent information from his front, is in touch with his flanks, gets his orders acknowledged soon after he sends them out: above all, if he has telephone communication with his subordinates—then the Signal Officer is happy. But it is a careful, chastened happiness; there are too many things which may go wrong, and if he is wise he will give thanks to God and make no boast of it.

On the other hand, evil communications corrupt good manners. If a headquarters is without information, without acknowledgment to its orders and with no certainty that its messages will arrive, then an intolerable burden of strain and uncertainty is thrown upon commander and staff. Curiously enough, commanders seldom seem to mind so much if communication is interrupted with the higher formation in rear.

Signals are faced with an ever-receding ideal, for new weapons and methods of war are evolved before the question of their control is considered. We can never attain that ideal and the most we can expect, faint but pursuing, is to reduce the distance which separates us from it. The brunt of battle is borne by our comrades who push the bayonet or fire the gun; our ultimate purpose is to serve their needs, and it is our pride to spend ourselves in that service.

IMPERIAL COMMUNICATIONS.

I must not end this lecture without a reference to Imperial Communications, which present a set of problems entirely different from those of communication in the field. Let us first see what Imperial Communications we have. Their foundation is the cable system.¹

This consists first of the great artery going East about through the Mediterranean and the Red Sea to India, the Far East and Australia. This is duplicated, but by no means on the same scale, by the cable round the Cape. Westward there are the Atlantic cables to Newfoundland and Nova Scotia, and from British Columbia there are the two great Pacific cables reaching New Zealand and Australia the other way round the world. The cables, generally speaking, are owned and controlled by private enterprise, subject to Government control in time of war.

Then there is wireless: First, the Government long wave station at Rugby which can broadcast to the world, reaching every part of the Empire and every ship at sea. This has no fellow in any Dominion to reply to it; and its main purpose is Imperial broadcasting.

Secondly, there is the Government short wave system which is to be constructed by Marconi and has now made a start with the link between England and Canada. This system is to be extended to India and the Dominions and will provide a network of wireless communication superimposed on the cable system already existing. Its purpose is the normal exchange of telegrams.

¹ See Map facing page 310.

So we have three main systems—cable, wireless broadcasting (long wave) and, just beginning, wireless short wave.

Looking at our three means in turn, we see that the cables provide us with a world-wide system which is possible for the British Empire alone among the Powers, for we alone control the landing points and the defiles which make such a system practicable. It is vulnerable to hostile landing parties where it touches at any weakly defended spot: we all remember how the "Emden" met her end in destroying the cable station on Cocos Island. Perhaps the system offers the greatest hostage to fortune where the cables leave the sea and venture overland from Alexandria to Suez. It is possible also for an enemy at sea, if left undisturbed for long enough, to grapple a cable from the ocean bed. In short, the safety of our cable system, like that of the Empire itself, depends first and foremost upon our power at sea and our security in Lower Egypt.

Coming to wireless, we find that the great Rugby station, short of invasion, is vulnerable to aerial bombing alone; it depends upon that measure of security provided by our national air defences. It would probably be impossible for an enemy to drown its transmission by deliberate interference.

The short wave stations also are vulnerable to bombing and the system seems to lend itself more easily to deliberate interference by an enemy, if he should think it worth his while. It is more probable that he would prefer to listen to what was being sent, or he might conceivably do both. Although short waves can be concentrated in beams, these beams are quite wide enough for any Power which wished it, either from its own soil or by agents abroad, to intercept the traffic. This, again, forces us to use cipher, but here, in distinction from wireless in the field, time is not of such vital moment, and the most secret and complex systems can be used and changed frequently. Generally speaking, the short wave wireless system, with its high speed of transmission, will be an immense asset as a reinforcement to the overtaxed cables.

For the cables will be overtaxed. One sometimes hears the argument that in war we should be able to manage so long as there existed enough communications for Government and strategic purposes, so that if, for example, the great Eastern artery were severed, say, where it crosses Lower Egypt overland, we could still manage with the cable round the Cape.

This seems a dangerous assumption; it is, in fact, belied by History. If the war taught us anything, it taught us that armed forces alone cannot prevail in a modern struggle; that we live by commerce in war as well as in peace, and that we cannot fight at all unless the organic life of the Empire goes on. "The Triumph of Unarmed Forces" formed the subject of a notable book on the war: that principle constitutes

a very real factor in any future war. Such a highly developed organism as the British Empire is thrown out of gear if its nerves—that is, its communications—are impaired. The fighting forces share the health and sickness of the Empire as a whole, and the Empire cannot be well without full and free means of inter-communication.

DISCUSSION.

AIR DEFENCE COMMUNICATIONS.

MAJOR C. L. DAY: As regards communications in air defence, the problem has, I think, been dealt with by the lecturer as far as mobile operations are concerned. In these, air defence units provide their own communications, supplemented by such additional means as can be made available by the formation to which they are attached.

The communications required by the air defence of the capital and of industrial areas, fall into a different category and owing to the large area involved must be largely made up of the public system of the country. These defences have been recently described in this theatre by General Ashmore, and as an example the requirements of the observer system may be quoted. This system consists of posts every six miles throughout the area liable to bombing. As the range of aircraft increases this area will increase. To link up these posts by special construction would be prohibitive in cost, and the resulting system could not hope to be as efficient as the public system which is constantly in use in peace. The policy is therefore to connect the various portions of the defences to the public telephone system, and to make detailed arrangements for the completion of the defence communications when required. These arrangements consist of switching programmes, which can be put into operation at a few minutes notice. So they must be practised in peace. There is no time for organization or practice during the period of strained relations. Our contract is to be ready at twenty-four hours notice, independent of any Act of Parliament. We cannot wait for the final arguments, the air raids of the enemy will probably come first and speed up the decision.

BRIGADE COMMUNICATIONS.

COLONEL T. N. HOWARD: As an infantry officer of thirty-four years' experience, a commanding officer in peace and war for eight years, and also as a brigade commander of many years' experience, I consider the importance should be emphasized of the difference between signal communications forward of brigade headquarters and those backwards from brigade headquarters. We are all told that fire is the predominant factor in war, but I really do not think those who have not seen it in the field realise what that means so far as signal communications are concerned. Fire is so tremendous nowadays that we cannot attack, except under very heavy bombardments, under smoke or at night, and my own experience is that all cable and visual communications (lamp, flag and so on) break down, and we come down to the man, to the orderly. I think far more importance should be attached to that fact—that in the end it is the orderly who takes the message, and the message will be either well or badly given in proportion as to whether that orderly is really well-trained or otherwise, and in proportion as to whether the officer, where he can write a message—(and that is not very often)—is trained to write a message. Therefore I say we should place far more emphasis on the training in writing messages and the training of orderlies.

THE CHAIRMAN: You mean verbal messages?

COLONEL HOWARD: I mean training officers to write messages, and, as they cannot often write messages, training orderlies to take them verbally. I have had many verbal messages given to me in the field by orderlies, and if I had acted on many of them I should have gone wrong, because the orderlies were not properly trained to give them. In front of battalion headquarters it is hell, and under those circumstances a man will give the wrong message unless he is wonderfully well-trained and well-selected. In my opinion, he is a specialist and should be treated as such.

INTER-SERVICE COMMUNICATIONS.

CAPTAIN E. ALTHAM, R.N.: The Lecturer has rather forced me to my feet by alluding to an incident connected with communications between the Army and the Navy which occurred when we were on active service together in North Russia.

A certain failure of communications between the two Services proved a very useful lesson and remedies were applied with the least possible delay. One of the first things was to ensure that we all talked the same language; this I venture to suggest is a most important thing to develop to-day. The subject of communications is, as the Lecturer has reminded us, no longer purely a matter for the experts in the fighting Services; it is an Imperial matter, and therefore ramifies right through civilian departments such as the Post Office, and even into commercial life. In this connection, I believe, a good deal has been done to ensure that the same "procedure" shall be adopted, both in the Services and in the civil systems.

Reverting to our combined operation on the Dvina River: when things had become stabilised a bit, we took the practical step of landing a number of naval signalmen and wireless operators, and embarking a number of Army signallers, with the result that when inter-Service communications were again put to the test their efficiency proved to be of a high order, so much so that during the biggest fight we had the G.O.C. at his command post at some spot in the forest was able to re-organize an attack which had gone astray and, with nothing but a field wireless set, indicate to me, in detail, the objectives, timing and nature of a new bombardment he wished the ships to carry out.

The naval observation position, to which the Lecturer referred, proved a most important cog in the machine of our communications. A small naval staff under an officer, in an advanced position on each bank of the river, maintained contact between front line troops and the naval forces afloat. It is desirable that this party should be equipped with wireless because they are liable to get out of visual touch with one or both Services. One of their most important duties is to keep the officer commanding the bombarding squadron informed of the positions and movements of the advanced forces ashore. It is a constant source of anxiety to those controlling naval gunfire in combined operations, if they do not know where these advanced forces are. Incidentally this same observation party can sometimes spot the ship's gun-fire.

Flexibility is of the very greatest importance for inter-Service communications of this kind. We cannot depend on a system of line wires which, even if they can be laid, may have to be uprooted or cut adrift at any moment. Communications between the Navy and Army must be of such a character that they are suitable for a war of movement.

There is one other practical point which I should like to mention. We found that in fighting of this nature it was most important that the signal staff should develop their powers of observation. That is a thing which perhaps in the naval Service our signalmen are more used to doing than their opposite numbers in the Army, because the signalman on watch on the bridge is bound to use his eyes. A man whose duty is to operate a morse key in a dug-out cannot of course do anything but pass and receive messages, but the signalman in a favourable position for visual work can, if he is trained to do so, act to an appreciable extent as an observer who can supply much useful information.

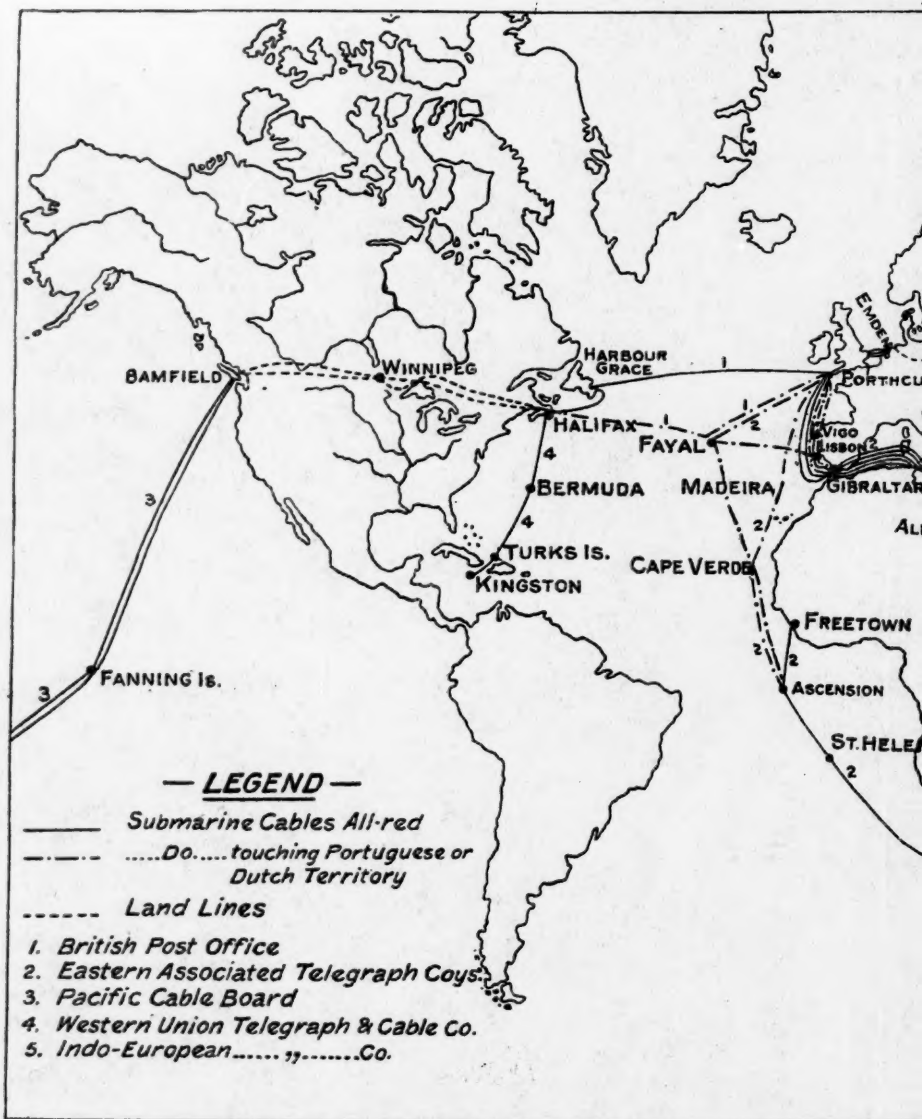
Last of all, the human factor comes in so very much at the top. The most important communications, after all, are those connected with the interchange of ideas and intentions between commands. If those links are sound and sure, things go well. The Lecturer alluded to the case of a combined operation in which the heads of the respective Services would be in the same ship. In the river operations to which I was referring we had the next best thing; the G.O.C. slept in a yacht moored alongside my ship, with the result that we communicated in person at least once, usually twice, a day. We had a telephone exchange which ran to Army headquarters on each bank, so he was in constant touch with his troops even when he was afloat. A naval launch was always at his service and a horse was always ready for me on shore. Those were very practical forms of communication. The supreme test came at a stage when the staff work and communications at Base Headquarters got a little out of gear, as these things will do in a crisis, with the net result that I, as Senior Naval Officer, got an order to hold the front, and the G.O.C. got an order to mine the river. However, it did not matter. The front was held and the river was mined!

THE CHAIRMAN.

GENERAL CAMERON, in referring to the Lecturer's views on the desirability of developing visual signalling, together with Colonel Howard's statement that the intensity of fire in the front areas rendered any form of signalling very difficult, pointed out that we must not take the late war in France as typical. He instanced the South African war, a typical British war and one of the biggest which the Empire had had to face for some generations. In that war intensity of fire was not such as to interfere with signalling, while guerilla warfare would have rendered cable almost useless and a message from column to column required a troop of cavalry to carry it, and therefore visual was of the greatest value; wireless would have been of priceless value.

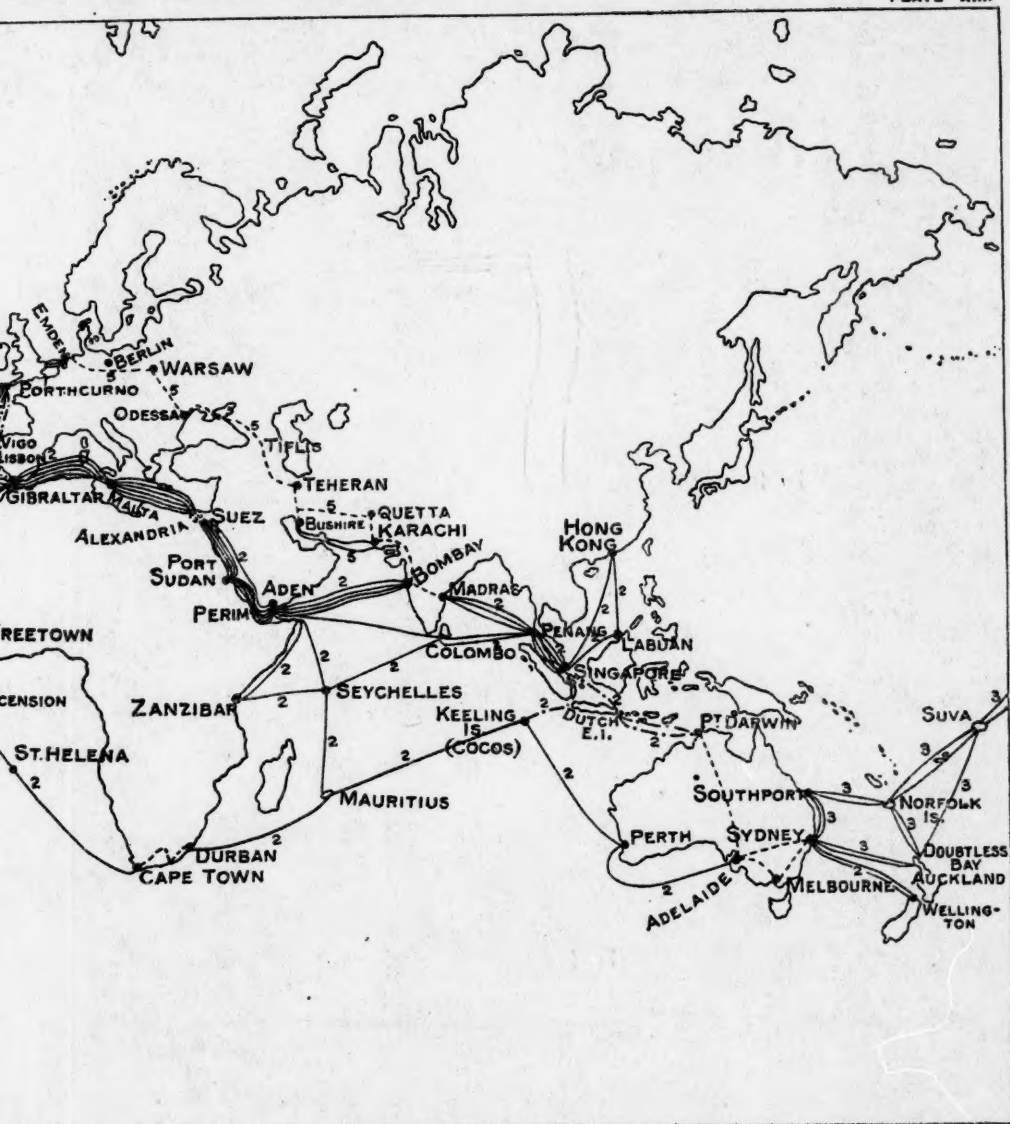
General Cameron added that the Lecturer was very careful to explain that what he said did not refer to signal communications on an old-established front. There is no doubt that, without an efficient and sufficient signal service, one cannot operate all the complicated and numerous weapons which are at our disposal to-day. The growing importance of the signal service is shown by the fact that, as far as he could remember, between the beginning of the war in 1914 and its end in 1918 the personnel of divisional signals had increased five-fold. The very numerous signallers we had in 1918 on the battle front, in a static warfare which had raged for so long, comprised a signal service which had gradually developed a large and complicated telephone and telegraph service, with a mass of cable. If allowance be made for the comparatively leisurely manner in which we prepared for battle, also for the fact that we arranged for the operations even down to the very smallest unit in the advance, that we had to gather an extraordinary

— ALL-RED CABLES —



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PLATE XIII.



amount of material before the battle began, it is obvious that we were compelled to make use of this enormous telegraph and telephone system. But that is not the problem which seems to confront us to-day. We have got to be prepared to fight with, probably, a small force, which we hope will be a very rapidly moving one, equipped with the latest devices of war. Thus it seems that the whole tendency will be for the proportion of cable to grow less, however convenient the telephone may be, and the proportion of other means of some kind to grow larger.

In his concluding remarks, the Chairman referred to the remarks of Colonel Howard as to the difficulty of carrying on communications in front of battalion headquarters except by runners and orderlies, and said he knew that others held the same view, but he did not believe that it was sound to entrust such runners with verbal messages, however well trained they might be.

Finally, he thanked the Lecturer for his very interesting lecture. His remarks were greeted with acclamation.

On the motion of LIEUT.-COLONEL SIR ARTHUR LEETHAM, a hearty vote of thanks was accorded the Chairman.

THE ROYAL NAVAL VOLUNTEER RESERVE IN THE EAST

By LIEUTENANT-COMMANDER, R.N. (Retd.)

(A resident in Straits Settlements)

THE Colony of Malaya, a name which can be made to include the Straits Settlements, the Federated Malay States and the Protectorates of the Peninsula, can at the moment lay claim to be considered among the most valuable and important possessions of the British Empire. The international significance of rubber and tin, combined with the inauguration of the Singapore base, have thrust the country into an unaccustomed prominence.

During the summer (there is little distinction where the thermometer is rarely below 85°) of 1926 the Europeans in the Colony were mildly interested to hear that the Admiralty had under consideration the formation of a "Royal Naval Volunteer Reserve (Malaya)." Notices were inserted in the local newspapers with a footnote to the effect that all clubs would be supplied with enrolment forms. By this means an easy and convenient method of volunteering was open to everyone; aspirants had merely to state under which of four sets of conditions they were prepared to serve, "in the event of the establishment of the Force," and to sign their names. The response to the call was not encouraging; among other things there was a shortage of enrolment forms, certainly in the Penang district, and in Kedah, where the writer is employed, none of the clubs received any forms at all. It is possible that Kedah, a so-called semi-independent province, was omitted for reasons of diplomacy. Unfortunately, there was considerable enthusiasm in this particular district, which, owing to the usual helplessness of an individual under such circumstances, found no outlet. The majority of Europeans in Malaya, however, can give very good reasons for not joining, and a few do not want to join. As will be seen, there is a remedy for each objection, and in the writer's opinion, which is submitted below, a very real reason for the creation of a Royal Naval Volunteer Reserve.

The British population of Malaya is divided under two distinct headings. By far the greater number live and work in the larger towns

such as Singapore, Kuala Lumpur, Penang and Ipoh, while the remainder are fairly evenly distributed over the length of the narrow peninsula on rubber estates and tin mines. The two groups have this in common that, with few exceptions, every individual signs an agreement which assures him a period of three or four years' continuous employment at a known salary, gives him a free passage home at its termination, and at the same time protects his firm against a rogue or the vicissitudes of commercial enterprise. Consequently, while he is in the East, the exile is expected to "devote the whole of his skill, time and energy" to the service of the company, which, in addition to paying his salary, has paid his passage out from England; and will in the course of time, provided he is re-engaged, send him home on full pay leave at regular intervals at the company's expense. Although it is clear that no definite objection would be raised to a short period of volunteer training, yet the absence of a number of juniors from a particular centre at any one time would be exceedingly inconvenient. None of the offices are overstaffed, and each individual is responsible for definite and important duties, which make a continuous call on his time. This must be so in a country whose entire trade is overseas, and where the times of arrival and departure of ships and the handling of their cargoes have a definite cash value.

The ability of planters and miners to join an organization which requires assembly depends on the transport facilities from the scene of their employment. For many it is quite impossible to attend camps or cruises because three or four days' preliminary travelling puts their training out of the question, while to those who are less inconveniently situated there applies the same hindrance as to the "office-wallahs." Leave of absence over more than a day or two is seldom even asked for, because both planting and mining work required constant supervision, whatever type of native labour is employed, and the European staff is always on a minimum basis.

Whether the following objection will apply to the naval side of volunteering is doubtful, but there are a few ex-Service men of reasonable seniority who definitely will not join the existing Volunteer Infantry and Machine Gun Companies. They feel that their training is already sufficient, and, further, they cannot reconcile themselves to serving under less experienced juniors, or under those whose position and seniority in the Volunteers has been attained by abstention from war service at home. The feeling between ex-Service men and "non-ex-Service men" is still very strong in a country where, say on a rubber estate, the senior assistant has returned from the war to find his prospective management taken and his promotion blocked by a man several places his junior who did not answer the Empire's call to fight in 1914.

Were it possible to bring home to the Europeans in Malaya, and more especially to those at home, the importance of a local Naval Volunteer Force in the protection of the flanks of the Singapore Base, a very

different response would be obtained. In the event of war there would seem to be little fear of actual invasion, but, to the writer's mind, the real menace to Singapore lies in the natural formation of the coast of the Peninsula, which would offer protection and secrecy to enemy submarines.

Dependent on overseas transport for all kinds of stores, for fuel and for personnel, a fleet based on Singapore could be rendered powerless, and would perish from sheer inanition were an effective blockade maintained by enemy submarines. This blockade, however, would be useless unless it was absolute, and to ensure that not a single ship escaped the patrol a very large number of submarines would be required. For example, the cordon would have to be of considerable depth to prevent a ship from steaming through unseen during the eleven hours of tropical darkness. No enemy would have sufficient submarines to keep out a full patrol while others were on passage to and from their home base for refuelling and storing. Thus an advanced base would become essential, whence in an emergency the whole force could be called at short notice. So far the words "advanced base" have meant a fixed point within easy striking distance of the enemy, but the development of submersible vessels need be carried very little further to render possible a craft of this type carrying stores, torpedoes and fuel for a group of fighting submarines. Germany could not use the "Deutschland" for this purpose chiefly owing to the difficulty of transferring heavy stores, especially torpedoes, on the open sea, but the logical development of her type would find ideal protection from the weather in the secrecy of the numerous islands and channels up and down the coasts of the Malay Peninsula. Relaxation for the personnel could be achieved on practically unvisited islets, and all the advantages of an advanced base would be enhanced by mobility. On the approach of a destroyer or trawler patrol the "base" would submerge.

Destroyers and trawlers, however, are not ideal for a search which would have to be carried out among narrow channels on a comparatively unknown coast. The thin skin of a destroyer and the unhandiness of a trawler make them uncomfortable in narrow waters. Available or not, no more suitable patrol vessels for these waters can be imagined than the old steam picquet boats. Built up and adapted to the tropics, they would possess, in spite of alliteration, seaworthiness, speed and, above all, silence, the great advantage of steam over petrol for this type of work. But there must be a considerable number of these boats on the Admiralty sales list, and the reconditioning of a small flotilla would provide the means for the training at least of the beginnings of a Coast Watching Reserve. It is also just possible that the existence of such a flotilla might turn the mind of a prospective enemy from the thought of using the coasts of Malaya for advanced submarine bases, and the immunity of the Singapore fleet would have been achieved before the declaration of war.

The writer's suggestion is, therefore, as follows :—

At each of the main ports of Malaya there should be berthed a certain number of picquet boats, fitted with a raised bow and gunwale and with removable awnings. During the week these boats could be under the charge of Malay engine-men and nucleus Malay crews. Neither the cost of preparation nor the maintenance charges will be of any magnitude. At first one, and then two or more of these boats could be brought into commission over the week-end to take out instruction parties of volunteers under a qualified officer. After ordinary pilotage and handling courses, advanced classes would be instructed in night work, with special attention given to local conditions, tides, etc., a great deal of which could be picked up from the coast Malays themselves. On shore the officers would be instructed in general service duties, in signalling, and in the handling of torpedo dropping gear and depth charge apparatus which would form the war equipment of the boats. By this means, at the outbreak of hostilities, an efficient coast patrol would come into being powerful enough to interfere seriously with the activities of enemy submarines, and of light enough draught to escape retaliation.

It remains to attract and interest more volunteers. This can only be done by explaining the conditions to the various business "houses" at home, whose money is involved in the security of Malaya. Once their understanding and interest is aroused, and they realise that a force of this nature, by its very existence in time of peace, will constitute a real protection in time of war, it will be a short step to the insertion in their employees agreements of the words, "and should if possible join the R.N.V.R. (Malaya), for which facilities will be given." After that, the process of enrolment would be all plain sailing, and those who are hesitating would see that, far from interfering with one another, as they may seem to now, the interests of their country and of their employers are identical.

AIR CO-OPERATION IN HILL FIGHTING

KURDISTAN, 1923

By LIEUT.-COLONEL G. P. MACCLELLAN, D.S.O., O.B.E., R.A.

DURING the last few years the advantages of employing aeroplanes in uncivilised hill warfare to do work hitherto performed by the Army have been urged with considerable energy in some quarters. The advocates of such a policy have, nevertheless, not yet apparently succeeded in convincing the military mind of the soundness of their views.

It is put forward as an argument in favour of this policy that it combines efficiency with economy, since hostile villages and townships can be destroyed by bombs, hostile personnel can be attacked by bomb and machine-gun, and habitations or crops can be fired by incendiary bombs. All this can be done from the air, as effectively as, much quicker, and with the employment of an infinitely smaller force than, when the operations are entrusted to ground troops alone.

It has also been claimed that, when an uncivilised hilly district is to be occupied, the operation can be carried out with a minimum of troops if they are supported by a force of aeroplanes which will wholly or in part perform the duties of reconnaissance, protection on the march, collection and dissemination of information, supply, and the work of the lines of communications, all of which tasks have up to now been part of the duties of the troops themselves. In short, a comparatively small body of troops can be committed to a campaign in hostile mountainous country without its commander having to trouble about his communications, or to weaken his force by guarding them on the ground.

It is understood that operations from the air alone have been carried out recently on the Indian Frontier. It is not proposed, however, to deal with such operations, but with the second variety, i.e., operations by a small military force backed up by an air force, or conversely by an air force supplemented by a small military force. The home of this latter form of warfare in the British Empire is at present on the borderland of Iraq, namely, in Kurdistan; and it must be clearly understood that operations in Iraq itself are not referred to. The greater part of Iraq is in no sense a mountainous country; it is, in fact, the exact reverse; and the policing of that region by an air force, which

can, as a last resort only of course, bomb the habitations, flocks, and encampments of recalcitrant tribesmen is an operation entirely different to that of occupying and pacifying a really mountainous country, almost destitute of roads, or at best possessing tracks fit only for pack transport, as is often the case along the Turkish and Persian frontiers.

The writer commanded a battery in what are believed to have been the first combined operations of this nature, namely, those in Kurdistan in 1923.¹ The impressions received as a result of that experience, impressions which, from conversations held both at the time and since with officers who took part in the operations, he has every reason to believe were shared by those officers, may conceivably be of interest to others.

The operations resulted in the permanent re-occupation of Rowanduz by the British, and the temporary re-occupation of Sulamania. The latter district was, however, again temporarily abandoned, not, be it understood, under pressure. It is not proposed to attempt to give an account of the operations, which have been fully described in the official despatches, but merely to consider certain aspects of the combination between the Army and the Air Force.

The offensive function of an air force in such operations divides itself into two parts: firstly, independent air action, such as bombing hostile villages and personnel at a distance from the military force, with a view to intimidating the enemy and to discourage them from opposing the troops; secondly, actual tactical co-operation with the military force.

The first, carried on as it is out of sight of the soldier, is probably to a considerable extent overlooked by him when he is estimating the relative effect of his own efforts as compared with those of the airmen. It must, of course, be extremely disconcerting to a tribe which is thinking of going out to war to find itself bombed when its intended enemy is still miles away, separated from it, perhaps, by nearly impassable mountain ridges; and it may very well be that a wavering enemy may thereby have his mind made up for him on the side of peace. On the other hand, a high-spirited race may be spurred on to retaliation by such action. What the effect may be in any particular case probably largely depends on the amount of damage done by the bombs. Dropping bombs from the air in mountains is undoubtedly an uncertain business, and reports from the bombers often appear to err on the side of optimism. This is easily understandable; many a shell which appears to drop in exactly the right place is innocuous, and many a bomb which seems to land on the right spot, also often fails to do damage. Since against small targets the percentage of bombs which fall in exactly the right

¹ It should be understood that the writer served with the column known as Koicol, and that he does not pretend to deal with anything that happened to the other column, Levicol, which was employed in the same operation.

place must of necessity be comparatively small, the effect of bombing from the air can very easily be over-estimated on such targets. On the whole, however, it may probably be safely granted that air action of this kind is decidedly detrimental rather than encouraging to warlike ideas in the minds of those bombed.

The second part of the air force role, tactical co-operation with the troops on the ground, can conveniently be considered under the headings : (1) Offensive Action ; (2) Protection ; (3) Information ; (4) Communications, with special regard to Supply and Medical Arrangements.

(i) *Offensive Action.*—This is by no means an easy matter to arrange. Despite signals and identification marks, it is very easy to confuse friend with enemy from the air, as was done at least once during the operations under review—on that occasion without any very dire results.

When a perfectly straightforward operation such as an attack on a position is being carried out, and the features on the ground are unmistakable, all may be well. If, however, anything that is not perfectly straightforward is being attempted, difficulties at once become apparent. There can be no opportunity of talking matters over, as the airman cannot, except very occasionally, get to the soldier in the hills, and in consequence everything must be arranged by wireless or by dropping and picking up messages. The latter is a difficult means of keeping up communication ; it pre-supposes suitable ground, which is not always available ; even when it is available, unless it be really good, several attempts are probably required before the message is successfully taken by the plane, so that the time required to talk it over by this means is almost prohibitive. Wireless, then, becomes the only really practical means. Radio-telephony will no doubt help matters, but even then the serious disadvantage exists that the two talkers are looking at the ground from entirely different points of view. In mountains, movement of troops is notoriously difficult to follow, and it is expecting too much of the man in the plane to ask him to distinguish friend from foe except in the very early stages of a fight ; and if too much be attempted there is grave risk of detachments being mistaken for enemies. In fact, offensive action from the air becomes less and less effective as the need of assistance becomes greater.

Considerable assistance may, on occasion, be given from the air by bombing localities which are being shelled by the guns. If, however, the enemy possesses artillery, the airman must be very certain as to which is his own artillery fire ; while blind bombing of a spot where shell are seen to fall may lead to a waste of bombs on the strength of ranging rounds which, particularly in mountains, are always liable to be wild at first.

It will, in fact, be probably not far wrong to assume that the man fighting on the ground will often feel happier if he knows that the man

fighting from the air will confine his attention to his more distant enemies.

(ii) *Protection*.—It has been claimed that, during a march, troops on the ground can be saved a vast amount of work in protecting themselves if the air forces co-operate; also that to picket the hills becomes almost unnecessary if their summits are watched from the air. It will not be easy to substantiate this claim in the light of the Kurdistan operations. The enemy encountered was in no way a master of the art of hill fighting, as is, for example, the Pathan; on the contrary, it would hardly be exaggerating to say that he was a contemptible enemy, largely by reason of the fact that in many cases he was only fighting because he feared his allies more than he did us.

In this connection the opening days were interesting; on the day when the first serious attempts at opposition were made aeroplanes were not at first in attendance, and they only came out when the news of the fighting was wirelessly to them. By the time that they arrived the enemy had decamped. On the following day aeroplanes were in attendance from the start, and there was no opposition, the villagers coming down in friendly fashion to watch the troops march along the valley. On the third day the enemy lay for the column on two sides, and when they opened on it with machine-guns there were no planes present, though they arrived soon after, and bombed some of the suspected hostile positions.

At first blush this statement of the facts makes it appear as if the enemy were kept off by the planes—when they were present he remained quiescent, when they were not he gave trouble. Further investigation, however, will produce other reasons for this phenomenon. On the first day he was at no pains to conceal his presence on a certain hill, though he went to cover behind it when the guns opened. One lucky round, it was afterwards reported from several independent sources, landed into a pow-pow, and laid out eighteen participants. This was much more than they had bargained for, and when an infantry picket got into some more with a Lewis gun, the whole lot cleared off, and went straight away to the place where they laid their trap two days later. They had entirely disappeared when the planes arrived, and the villages past which the next day's march was conducted being all friendly, or having decided to become so on hearing of the very untoward incident which had befallen their countrymen, there were no enemy in the neighbourhood to give trouble. On the third day, it is true, the first attack was begun when planes were absent; but, on the other hand, a second attack was made when planes were flying overhead. A few days' later when a column marched over the Bhejan Pass to Rowanduz it was reported from the air as not held by the enemy, though bombs were dropped as a precautionary measure. The Pass, as it happened, was held, though but lightly, as the enemy opened fire on the leading

infantry as they approached the summit ; they left as soon as the guns opened fire.

It can hardly be maintained in view of all these facts that the enemy were held off by the planes, and picketing was invariably considered necessary, though not to anything like the extent required on the Indian Frontier. This, however, was due to the inferiority of the enemy, and not to the protection afforded from the air. It is not possible for the soldier to regard with equanimity the idea that, against a really live enemy, the number of troops can be to any appreciable extent cut down on the assumption that the work of protection on the march can be done from the air ; even against an incapable hill fighter like the Kurd nothing happened to encourage the belief that such a course could be anything but disastrous against a brave and enterprising enemy. Picketing on the march is an operation which requires careful co-ordination, which must be arranged by one authority. To have part done from the ground and part from the air is surely unsound ; the whole thing must be done by one or the other. That it can be done entirely from the air will not, it may safely be asserted, be admitted by a single soldier who has ever had practical experience of the business.

Against this view it may be urged that the combined policy was a success in Kurdistan. The writer believes this to be a mis-reading of that result ; there was nothing whatever to indicate that the comparatively few infantry pickets which were employed would not have been sufficient to deal with that particular enemy, and that the result would not have been equally good had not a single plane been present to assist.

It is unnecessary to point out that during the hours of darkness and in foggy weather the support which can be hoped for from the air is nil.

(iii) *Information.*—With the number of troops reduced to a minimum the air becomes of necessity one of the chief sources of information. The statement that air information is largely negative is particularly true if the theatre of war be a mountainous one. For riflemen to conceal themselves from the air in rocky mountain country is not a difficult matter if they study the question with intelligence ; and the airman is faced with the difficulty, first of seeing anything at all ; second, of deciding whether what he has seen is friend or foe ; and third, of conveying his information to the proper quarter.

It is fairly obvious that he is most likely to see friends, who are not hiding themselves from him.

The experience in Kurdistan, so far as could be judged on the ground, was that more was seen from the ground than from the air (this, of course, refers to the country in the immediate vicinity of the troops). One airman, at any rate, admitted the great difficulty he had in spotting the enemy, and suggested that his best course of action was

to bomb where the artillery were shelling, a somewhat significant reversal of the ordinary rôles of artillery and aeroplanes. On one occasion a plane had a hill indicated to it from the ground by the R.A.F. liaison officer as harbouring snipers (so at least we were informed at the time), who closed down when he bombed the hill. As showing the difference between the Kurd and the Pathan it may be mentioned that three or four parties of snipers on the hill were plainly seen from the battery position long before this occurred. They were firing at the extreme range of their rifles, and as they were too far away to do the camp any damage it was decided that they were not worth the expenditure of valuable ammunition, in view of the very strict order that none was to be lightly fired away on account of the impossibility of replenishing the supply, and because the Bhejan Pass, where a stiff fight was probable (this, as it happened, did not materialise) was still in front of us.

The obvious difficulty of obtaining information from the air under such conditions may, perhaps, be appreciated from the fact that from first to last no target was indicated to the artillery from the air; while, as stated above, a target was indicated to the air from the ground.

(iv). *Communications*.—In the circumstances under review communications on the ground are, to all intents and purposes, non-existent once the military force becomes involved in the mountains; with troops reduced in numbers as they are, there are none available for such frivolities as guarding communications, or there will be none left for an advance. The idea that communications, other than those by air, can be dispensed with is, in fact, the *raison d'être* of such combined operations.

An investigation of such a system proves, it is submitted, beyond question that against a live enemy it must fail. The disadvantages will be briefly considered under the headings of Supply and Medical arrangements.

With no ground communications there are only four possible ways of supplying a force, viz: (a) By taking with the column all supplies, ordnance stores and ammunition that can be required; (b) By partly living on the country for food for man, or beast, or both, and taking the other items with the column; (c) By air; and (d) By a combination of (c) with (a) or (b).

The advantages of (a) are that at any rate the food and supplies are there, and that the commander of the force knows exactly where he is with regard to them. The disadvantage is that it means an immensely long train of pack animals and their drivers, with all the well-known troubles of rations for them both, and the excessive proportion of transport required to support itself before provision for the fighting man is made at all.

The advantages and disadvantages of (b) are much the same as those of (a), the reduced reliability of food supply being to a certain extent set off by a gain in the matter of the number of animals required. It is

unnecessary to labour the disadvantages of either system, as they are universally recognized.

The third alternative, supply by air, is but a precarious means of existence for the troops. It was seriously tried on a big scale in Kurdistan once only, and that attempt cannot be described as a success. The column was beginning to run out of barley for the mules, ghee for the Indian troops, and boots. A number of Vickers-Vernons were employed to replenish the supply. A piece of ground was selected by the R.A.F. liaison officer, and was cleared as far as possible, and marked under his supervision by the infantry the evening before. The camp was apparently badly sited for the dropping business, though there did not appear to its inhabitants to be anything abnormal about its position. Be the reason what it may, only a negligible quantity of the supplies dropped fell on to the ground prepared to receive them, the remainder falling, some in the camp itself, and a by no means small proportion outside it in ground from which recovery was not possible. Of those which fell within reach a very high proportion was lost, or rendered useless, owing to the sacks, etc., being broken on landing. After a mule had been knocked over, a tent entirely destroyed, and various individuals, including the supply officer, had only escaped injury by their agility, it was decided by the O.C. Camp that the meagre addition to the ration and boot supply was not worth the risk to life and limb incurred in receiving it; so the despatch of further consignments was stopped by wireless.

That it may have been a remarkably unlucky day may be conceded at once. At the same time, the problem of preventing the goods from being damaged on landing when, of necessity, dropped from anything but a very low height, is not an easy one to solve. If each package is to be padded enough to prevent damage the bulk will be much increased, and the carrying capacity of the planes correspondingly diminished. This appears to rule out this method of supply except, in special circumstances, to very small forces, such as beleaguered posts. In any case, it does not appear to be a satisfactory method of supplying artillery with ammunition in any quantity; nor of supplying fodder for animals, or anything liquid for human beings.

In the case, rare in mountainous countries, of a force being able to select a camping ground close to a natural aerodrome, supply by air would obviously be more feasible; it must, however, be expensive in planes even then; and the difficulties as regards gun ammunition and the special articles of supply mentioned above are but little lessened.

The only possible conclusion arrived at as the result of this experience was that methods (a) and (b), with all their disadvantages, were alone to be relied on. In the case of the guns this was clearly indicated at the commencement of the operations; an ammunition column of camels accompanied the force; and it was ordered that ammunition was not to be expended except at really good targets, as there was no means of

further replenishment. Such limitations would hardly be possible except against a very feeble enemy.

The principal failing of air communications was, however, in the medical arrangements, and, as it happened, these were very severely tried. An outbreak of dysentery, mostly in one battalion, traced eventually to a germ-carrier, and aggravated by the really atrocious weather conditions, sent some 200 men into hospital in the course of a few days, and they, with a few wounded and accident casualties, made up a total of over 200 men who had to be evacuated by air. That this was safely accomplished was undoubtedly a very fine performance on the part of the R.A.F., but the limitations of this method of evacuation were nevertheless very obvious. For a period of about eight days no plane could, on account of the nature of the country, land near the column, and the sick and wounded had to be carried along with it. By the end of that time the stretchers and dhoolies, carried by local inhabitants pressed into the service and by parties of troops, as well as by the regular dhoolie-bearers, took up an amount of space in the column, and absorbed such a number of fighting men, as to render any kind of march a most perilous proceeding against any enterprising enemy. The fate of the sick and wounded under such conditions cannot, in fact, be anything but deplorable; the force is too small to allow of anything but an occasional post being formed for their reception along the line of advance, so that normally they must accompany the force under all conditions of weather and hostile action until such time as it reaches ground on which hospital or troop-carrying planes are able to land; in mountainous country landing grounds for light, let alone heavy, planes are rare enough. That such may be their fate in any campaign, on occasion, is of course a fact that every soldier must face; it does not, however, appear to be sound to accept it as a normal procedure in modern campaigning.

(v). *Conclusion.*—In considering the feasibility of such a campaign in countries other than Kurdistan, and against enemies other than Kurds, it must be borne in mind that the latter are, and this cannot be too strongly insisted upon, in every way very inferior to the tribesmen of the North West Frontier of India. Although they will, on occasion, push home an attack against a force caught at a great disadvantage and much outnumbered, they have none of those qualities which make the Pathan so formidable an enemy: as marksmen they are not to be compared with him. The consequence is that liberties can with safety be taken when fighting against the Kurds which on the Indian Frontier would involve a force in hopeless disaster.

The column with its quite undue proportion of supply animals and their attendants; the weakness of a perimeter camp with so small a proportion of combatants to guard it; the difficulty of evacuating the sick and wounded; the limitations of ammunition supply; all these are unfavourable factors which are hardly balanced by any corresponding advantages derived from the support which can be afforded from the

air. If the terrain be such that planes can land on as many days as they cannot, many of the disadvantages may be considerably reduced; but in the really mountainous parts, where planes cannot land at all, ideas as to the amount of help which the troops can expect to receive from the air can very easily be exaggerated.

The above remarks apply, it must again be emphasized, to actual tactical operations and communications in the immediate vicinity of the fighting troops. To what extent communications to an advanced base, situated in potentially semi-hostile country in rear of the fighting columns, can be maintained by escort from the air is another matter, with which the writer does not attempt to deal as he had no experience of that problem during the operations in question.

TRANSPORT AND TACTICS

By CAPTAIN H. J. COOPER, R.A.S.C.

THE circumstances of the period which has elapsed since the Armistice of 1918 have led to the recasting of many military ideas. None have been so deeply affected as those which concern movement and the varying methods by which it is achieved both on the ground and in the air. It is only of late years that marching and the use of riding animals have been supplemented by motor transport. So recent, indeed, is that change that even Field Service Regulations appear to give inadequate information concerning its organization, use and protection. There is a reason for this in that the strategic conceptions of commanders and the execution of tactical plans of subordinate formations still rest on a basis of considerable tradition fortified by the experience of many campaigns conducted by soldiers of true ability. Neither can such weighty experience be lightly set aside. Yet, when looking ahead in an endeavour to reduce future conditions to military formulæ, the student is confronted by two obstacles. The first is a considerable and growing tendency to upset at all costs the existing organization of military transport; the second and more important may be adequately expressed by an adaptation from the late Field Marshal Sir J. F. Burgoyne: "the art of applying mechanized transport to the greatest advantage is yet unknown¹." It is with this last basic fact, and not with its more temporary attendant circumstances, that all armies are chiefly concerned. Upon a successful solution of this enigma in great measure depends the issue of future campaigns.

The problem is to create a tactical system by which both the correct utilization and the safety of mechanized transport may be assured, since it is enunciated in Field Service Regulations that "Success will depend as much upon the arrangements for rapid mobilization and concentration and upon the organization for keeping the army supplied with its daily requirements in personnel and material as upon the skill with which the operations are conducted²."

¹ The actual words were "The art of applying mounted infantry to the best advantage is yet unknown."

² Sec. 5 (b), F.S.R., Vol. II, 1924.

A transport unit or group of units having been created, it is the first responsibility of their commander to ensure their security and also to be assured himself that there is the maximum co-operation with the other arms. That this may be possible it is pre-supposed that there has been a common military education for the transport and convoy commanders and also that each is to some extent practised in, or at least familiar with, the other's duties and difficulties. For instance, it will be of the greatest advantage that the officers of the units which will form the spearhead of an advancing force have more than a passing knowledge of the capabilities of the vehicles which transport and protect them; just as it is essential for the transport commander and his officers to be more than amateur motor engineers. Indeed it is imperative that the transport officers should also possess some knowledge of infantry work, since they must be able to understand the scope of the task in hand in order to ensure the rapid and accurate execution of their share of the operation. "L'expérience de la guerre a confirmé encore une fois de plus la nécessité d'une instruction d'autant plus soignée que les armes sont plus perfectionnées."¹

To turn to the tactical system upon which movement will be based and by which security will be established. From the many expressions which attempt to define and to elucidate the meaning of the word *tactics* it is necessary to make a choice. "The art of moving large bodies of troops in the battle area by such combination of manœuvres as shall assure superiority over the enemy" is one which is taken as satisfying all claims. It is also true that scientific changes which have increased the speed and capacity of transport have modified tactical methods, yet it is also necessary to pay due consideration to the ancient aphorism that the basic principles of war are immutable. They cannot altogether be set aside because transport now possesses a vast superiority of endurance, speed and mobility over the old-established combatant arms.

With regard to transport itself a final explanatory note is required. Methods of transport which are available for an army to-day may with convenience be divided into seven classes. While some are suited to the carriage of troops exclusively, others can be used only for the carriage of material, whilst some are available for both. They are:—(1) animal saddle; (2) animal pack; (3) animal wheeled; (4) mechanical road and cross country; (5) mechanical rail; (6) inland water; (7) aerial. To these might be added an eighth class, namely, the cycle.

In order to understand the obstacles and the volume of the pre-conceived ideas that surround the subject, a rapid survey of the historical aspect of transport may serve its purpose.

Over two thousand years ago the value of the mobility of an army was fully realized by the great military brains of the period. Some find that the decisive success of Alexander the Great after the battle of

¹ Instruction provisoire sur l'emploi tactique des Grandes Unités.

Arbela may be attributed directly to the fact that he dismounted a portion of cavalry and mounted fresh infantry on their horses. By this means he gave great impetus to the pursuit and clinched a magnificent victory. The Romans built roads to facilitate their military movements. During medieval times, however, the value of mobility was lost to sight owing to the use of the armoured knight who became a species of more than unwieldy tank on the battlefield. Bad roads, heavy firearms, clumsy equipment delayed the recovery of mobility for centuries. Napoleon it was who virtually re-discovered the vanishing art of movement.

During the nineteenth century the small wars that were carried on within the present British Empire to some extent clouded the issue. Transport, however brilliantly organized and employed, was often regarded as an encumbrance and not a means to achieving victory. The creation of mounted infantry, however, in those parts of Africa where the transport of troops was seen to be essential was a step in the right direction; the animal was introduced as a means of increasing the mobility of the foot-soldier. The South African War witnessed the creation of large bodies of irregular horse that had as their sole *raison d'être* the necessity for enhanced mobility in a roadless country. The railways also assumed a fresh importance.

At this period the cycle was introduced as a form of army transport. Nevertheless the requirements of the small war, and also, it may be claimed, the weight of tradition, militated against its whole-hearted adoption. The cycle was relegated to the Territorial Force and to Home Defence.¹ It was left to an Oxford professor to advocate the value of the cycle as an adjunct to European warfare.² But the cycle never came into its own.

On the Continent the utilization of railways for the rapid mobilization and concentration of troops as a prelude to "lightning" victories was absorbing the attention of all General Staffs as the result of the Prussian successes of 1870. Huge armies were scarcely to be moved except by train or by route march.

Then came the Great War with its enormous expansion of mechanical transport. For a variety of reasons the campaign never afforded an opening for the tactical employment of that type of transport. Hence we are still groping for the true solution of the problem.

Two circumstances may be advanced to show how far we stand from the end of this search. Firstly, we are still hampered by the fact that in many parts of the world our transport problem is not so far removed from that with which we were faced half a century ago. Secondly, our ideas as to the necessary tests of the capacity of mechanized transport have not emerged from the days of the horse.

¹ See "Tactics of Home Defence," by Major C. E. Callwell.

² The late Professor A. Cook Wilson of Oxford.

The former topic will be considered first. It possesses a certain importance as still lying within the sphere of our military activity, thus serving as a *point d'appui* for military conservatism. Nevertheless, it forms a convenient base for any discussion of modern transport, and so we will consider it.

The tactics of horsed transport are comparatively simple as it does not itself contain the elements of resistance, special troops being required for its protection, while it is not proposed to use it for troop movements.

The history of the Indian Army, more especially of the expeditions into Afghanistan and accounts of the minor expeditions summarized in "Small Wars, their principles and practice," (1906), afford examples of the defensive methods adopted by transport escorts in open warfare, hill warfare, bush and desert fighting.

The factors which affect the situation are :—

- (1) The avoidance of contact with the enemy ;
- (2) The concentration of the escort ;
- (3) The concentration of the convoy ;
- (4) Continuous movement of the convoy.

The incidence of these factors is governed by the topographical features of the theatre of war, the speed and importance of the convoy and the size of the escort ; for instance, the distribution of the escort of a convoy advancing across the desert would of necessity differ from that necessary to ensure the safety of a column in hill warfare. The dispositions of the two columns would themselves differ as would that of a carrier column in bush warfare again differ from the preceding cases.

It is, therefore, seen that pack and animal draught transport have of themselves no tactical significance, their safety on both upward and downward journeys being entirely dependent on the escort. When, in the last resort, a convoy has to meet a concerted enemy attack, then the vehicles may be formed into a square and pack loads made to increase a defensive perimeter. The animals may be stampeded into the enemy or driven in the direction of safety and reinforcements. The men, if they are trained soldiers, as they very properly should be, are able *in extremis* to augment the resistance of the escort, but in normal cases they must be definitely forbidden to sacrifice the extrication of the convoy to the provision of desultory and inaccurate fire. Should surrender be inevitable then must the contents of the convoy be fired. That is very much the state of affairs to-day, although in certain areas, such as Waziristan, the construction of a great motor road might conceivably modify the situation.

Secondly, we have to admit that we have not yet reached the stage whereby the capacity of mechanized transport can be properly tested. As far back as 1903, in the first Army Manœuvres after the

South African War, the two opposing sides started from the two opposing terminals of Corsham, near Bath, and Aldershot-Petersfield. In 1925, it seems incredible that manœuvres intended to test mechanized forces should start from Salisbury and Aldershot, a lesser distance apart than in 1903. If this be the result of financial needs, it is more than regrettable. Now, in order to test the potential uses of mechanized transport, its capacity for progressing on local supplies of fuel, spare parts, and for subsisting on emergency repairs, this distance should be increased to some 300 miles or, say, the run from Northumberland to Hampshire. Such a scheme was advocated some time back when it was suggested that a wheeled transport force should advance from Kent against a track-transport opponent coming from N. Wales.

There exists, of course, the further possibility of employing aerial transport for actual troop movements both in civilized and uncivilized warfare. But this aspect of the problem has been deliberately set on one side during the present discussion.

It is with mechanical road and cross-country transport that we are chiefly concerned inasmuch as in every civilized theatre of war there exist roads of a kind leading from bases and railheads upon which mechanical road transport is able to work, thereby shortening the stage of animal and carrier convoys. As with the advent of mechanical road vehicles, so with the elaboration of cross-country vehicles. Their use increases in importance as density of the population and the intensity of industrialization in the projected theatres of war; for instance, in those areas of Europe where several great nations could rapidly mobilize large mobile forces, cross-country transport might easily become the determining factor in the campaign. In Tanganyika Territory, on the other hand, its use would be definitely limited, while in Burma the presence of cross-country transport at certain seasons would be an encumbrance.

But it is also important to bear in mind the many various applications of mechanical transport, for there seems no limit to its uses; it can assume the guise of cavalry, mounted infantry and the train, while it will haul the heaviest artillery with like facility.

Again, there now exists many types of mechanical vehicles:—the armoured car, the tank, the supply tank, the plain carrier type of van and lorry, the car, the tractor and the gun tractor. Of hybrids, too, there are many, chief among which is the "one-man-tank." The extended operations which modern war comprehends and the pace at which it develops have assigned certain roles to various vehicles. The armoured cars, light tanks, and some hybrids correspond to the cavalry. Unarmoured cars,¹ the lighter forms of van and lorry take the part of mounted riflemen as they simply carry men to battle, retire to a rendezvous ready either to bring more or await orders from the first contingent.

¹ That is vehicles carrying no armament as part of their equipment.

Yet there are other differences in their capacities. The heavier lorries, as has been shown, are incapable of providing for their own safety. The heavy gun carrying tractors and haulage tractors moving in rear of tactical areas possess special qualities that demand separate discussion. Our present purpose will best be served, if the three classes of vehicles first mentioned are alone treated.

The factors which govern animal-wheeled convoys also govern mechanical convoys, whether the load be men, supplies or stores, the vehicles actually exist and are familiar to all soldiers by sight and to many by experience. But the methods of their use are somewhat obscure.

A comparison of the characteristics of cavalry and armoured cars¹ shows that the latter has less mobility than the former; that, while being unable to search ground with equal thoroughness, the armoured car can out-distance cavalry on roads. In this simple feature lies a danger of their being sent on ahead to seize tactical points and during the subsequent period of resistance there is a danger of their destruction. They must never be used as mobile forts. The aim of the reconnaissance of both arms is to supplement that of the R.A.F., but although intelligence collected by mechanical vehicles may cover a wider field than that of cavalry, yet the latter may be more certain and reliable. Timidity may result in vehicles being used as forts which is dangerous. The ability of armoured vehicles to force a passage for infantry through wire is their special attribute and their drain on the physical endurance of the crew exceeds the physical calls made on a cavalry soldier.

One instance of the employment of a mechanized advanced guard with a partially mechanized force² must suffice for an example. So we will take the case of a mechanized advanced guard of an advancing force. Since the method of movement is mechanical, the horse soldier is not available for protective duties. Of this case much has been heard in military discussion and periodicals; it is one which is usually quoted by the "100-miles-a-day" or "see-Europe-in-a-week" school. A suitable starting point may be taken to be the enunciation of the chief variables or governing features of the case:—

- (1) The replacement of horsed by mechanical transport is only a means of accelerating the courses of the opening phases of war; it is not an end in itself;
- (2) Owing to the use of mechanized formations being inadequately understood and of recent origin, there is neither tradition nor precedent upon which to draw for guidance;

¹ Secs. 14 & 16, F.S.R., Vol. II, 1924.

² The cases of a non-mechanized force and a completely mechanized force are not now being analyzed.

- (3) The objective method of search may alone be used as only an inventory of the available means can be made and this revised as time and opportunity offer. It is futile to mould realities from one's improvised conceptions¹;
- (4) The mere announcement of the technical possibility of a mechanized force is not a postulate of its infallibility in the field ;
- (5) The evolution of the cross country tractor is the limiting factor and there is no sign that such a vehicle will be available in large numbers at the declaration of war for many years ;
- (6) The impossibility of replacing the standard animal by a standard vehicle ;
- (7) The dissipation of research effort—there are many forces trying to seize control ;
- (8) The heterogeneity of available transport ; speed, protection, armament, and circuit of action all differ ;
- (9) The scale of time and space have altered and there is much confusion of thought with regard to these factors in future war.

The opening phase of a campaign in which the aggressor has a mechanized spearhead for his national army is visualized to consist of the following stages :—

- (1) Rapid military mobilization ;
- (2) More rapid industrial and technical mobilization ;
- (3) Perfect embarkation arrangements for a mechanized force ;
- (4) Rapid advance into enemy territory to :—
 - (a) Seize important tactical points and to obtain command of industrial areas ;
 - (b) Create a favourable situation amongst the enemy population for propaganda work ;
- (5) Establishment of a secure line of communications concurrently with (4).

The operation of moving a force from the base to the area of concentration, may for the sake of clarity in the present instance, be considered immune from enemy interference. The operation of moving the spearhead forward from the concentration area consists of assuring the safety of a convoy by means of aeroplanes, armoured cars, tanks and possibly self-propelled artillery. The principles involved are those

¹The "100 miles-a-day" school have been the great exponents of this method. They conceive of an army of tanks previously discerned only on the threshold of consciousness, passing over enemy country propelled only by an uncontrollable will to proceed. They advance their force to certain dissolution.

of an advanced guard but the method of execution is peculiar to the enterprise.

There are three methods by which it may advance.

- (a) As a force with a protective screen ;
- (b) As a force without a screen ;
- (c) As a force advancing along a piqueted road.

(a) A cavalry screen in the past has provided both protection and facilities for reconnaissance and partaken of the nature of a wall through which the enemy has forced his way in order to gain information. Nevertheless, the screen which must be provided in the future will be of a "wall-cum-blanket" form through which the enemy must burst in two directions. Therefore, it is seen that the wall must be formed by apparatus combining fire with movement, two-man-tanks,¹ armoured cars and tanks supported by highly mobile artillery. Also that the blanket must be formed by a combination of aeroplanes and anti-aircraft artillery ; all will need to be reinforced by rapid anti-gas measures. The establishment of the screen is provided for in the existing regulations² ; the conditions precedent for success being perfect co-operation between the aircraft and the screen commander and powerful ground anti-aircraft defence. Behind this screen would be an advanced guard.³ Thus is weight given to the argument that there must be a military air arm.

(b) It has now become obvious that the increased speed of the main body has thrown an almost intolerable burden on the advanced guard commander. He is forced to clear an ever-increasing front at an ever-increasing speed, also to regulate his movement with regard to similar formations on his flanks, the commander of which will be beyond V/T distance and scarcely able to keep in touch with his aerial reconnaissance. During this phase wireless silence will be almost certain⁴ and inter-communication will be difficult. Normally he will proceed by road but his vehicles have a cross-country performance which will, vis-à-vis of the convoy, be at least equal to the cavalry/infantry ratio. It is here of interest to consider the factor of space. In war, as envisaged at present,⁵ the distance between the mounted patrols of an advanced guard of a single column and the head of the main body is

¹ The usefulness of the one-man tank is denied. After its invention frantic efforts were made to incorporate it in the army instead of deeply studying the problem and then endeavouring to apply inventive genius to its solution. Also it is clearly beyond the capacity of one human being to drive and to fire with accuracy from a vehicle proceeding at speed over trackless country in the face of the enemy.

² Sec. 44, F.S.R., Vol. II, 1924.

³ Sec. 45, F.S.R., Vol. II, 1924.

⁴ The progress of W/T and R/T may make it possible to carry out "closed" conversations.

⁵ F.S.R., Vol. II, 1924.

11,500 yards and the width of the area traversed may be 4,000 yards. In order that a mechanized column may move at 10 m.p.h. it will be necessary to have the main guard 10/15 miles from the main body and the vanguard 10 miles ahead again. Further, flank guards must be anything from 10 to 20 miles out.¹ Thus an advanced guard commander may be compelled to receive messages from within an area of 500 square miles, and this during an enforced wireless silence. Aeroplanes, heliographs, flares and pigeons seem to be his only methods of communication.

In order that a correct appreciation may be made of the task of the advanced guard commander, it is now necessary to consider the factor of time. The ratio of the rate of movement of the scouting troops to the main body of a non-mechanized force, that is the rate of speed which cavalry could proceed across country, to the rate of speed which infantry could travel by road, is seven to two-and-a-half.² It has been found that, even with this superiority of speed, security cannot be assured without occasionally halting the main body. With a mechanized force moving at eight miles per hour, and assuming that security can be achieved, the pace at which the advanced guard scouts must move, and continue to move for one day's march, must be $7/2.5$ of 8 equal to 22.4 miles per hour, and it is said that one day's march may approximate to 100 miles. To imagine that any form of land vehicle may take a line across European country, search it thoroughly, reduce minor opposition and maintain an average rate of movement of twenty-three miles an hour is to fall into grievous error; to claim that this is possible is to be guilty of self-deception. And eight miles an hour for a twin pneumatically tyred vehicle is a conservative estimate. Again, it is necessary to envisage the factor of time with regard to the question of inter-communication. A trooper carrying an urgent message can move at fifteen miles per hour for short distances; a cyclist may similarly move at fourteen miles per hour but for longer distances, thus the pace of the message carrier is twice that of the mounted troops, so that for a message-carrying vehicle capable of message rate of speed forty-six miles an hour is necessary. There is no military vehicle in use to-day which can fulfil this condition. The W/T and R/T facilities are not to-day sufficiently developed to replace V/T and the rider-carried messages.

(c) It is now urgent to consider the last case. As in mountain warfare the ground from which fire can be brought to bear upon the advancing column is piqueted, so may the area through which a mechanized column is passing also be piqueted by a fixed or mobile

¹ This is governed by the fact that in European countries parallel roads are found at an average of fifteen miles lateral intervals. The G.O.C. of the column would be moving between the vanguard and the main guard in order that he might be able to receive early information of enemy movement so that he would have the longest possible period in which to make his dispositions.

² Note to Sec. 152, F.S.R., Vol. II, 1924.

interval system of protection and communication. As shown in (a) above, attack may be delivered in two dimensions, so then must there be a two dimension defence. Thus it is not without interest to compare the intelligence available at the outset of a campaign with regard to the progress of a mixed brigade on a piqueted line in mountain warfare and a mixed column on a piqueted road in mechanical warfare.

Two facts will now stand out clearly : firstly that information with regard to the tribal antagonist is nearly complete ; secondly, that opposition which the mechanized force will meet is almost unknown. That there will be much artillery, many mines, gas and destroyed communications is certain, but the power of the weapons and incidence of destruction are indefinite. Further, that into this uncertainty the advanced guard is moving at over twenty miles an hour and the infantry in lorries are approaching it at about ten miles per hour, whereas a column in hill warfare moves at two miles an hour against an enemy whose method of progression is by "fleetness of foot."

Therefore a cursory examination of the problem which penetrates no deeper than the surface is seen to throw into the strongest relief minor problems of considerable difficulty, and the student is forced to conclusions which may conveniently be tabulated as shown below :—

- (1) To move a column of all arms on one road at an average rate of speed of eight miles per hour is problematical ;
- (2) To move at this rate of speed in enemy country with security, is impossible with present vehicles ;
- (3) To search the requisite area with existing vehicles is also an impossibility, without jeopardising the force concerned ;
- (4) To maintain requisite intercommunication, a fixed interval system of communication is not possible for a normal march with the present scale of signal equipment ;
- (5) To maintain intercommunication by means of W/T and R/T when on the move requires a perfect signal service, both in apparatus and skill of operation.

By proceeding into enemy country without adequate protection, annihilation is certain ; by "debussing" troops too far behind the line upon which contact with the enemy is expected, time is lost and the troops suffer from avoidable fatigue. On the other hand, it is seen that too great an advance may compel a forced "debussing" under enemy fire which may result in large casualties, greatly depleted transport and blocked roads ; this latter constitutes a serious menace.

Finally, having proceeded to a consideration of the methods by which convoys of mechanical transport may move in a tactical area it is justifiable to pause to consider the circumstances under which the prevailing ideas concerning the latter have taken root. Ideas, we are

told, well to the threshold of consciousness unbidden and unprovoked, and many ideas from the minds of not a few soldiers and civilians, have overflowed and flourish in all ranks of the army. Neither is this irrelevant nor yet a shallow quibble.

There are two methods of search by which each one endeavours to ascertain the truth.¹ The objective method and the subjective method. The successive stages of enquiry are observation, hypothesis and verification.

The objective method operates by the observation of phenomena, conjecture as to their inter-relation and then verification of the conjecture; in this way no conjecture is ever relied upon as a fact and no harmony of thought is relied upon to imply a harmony in the arrangement of phenomena. To apply this method to the evolution of the tactics of mechanical transport. The observed phenomena are the vehicles of transport of civil life, the power of endurance of the soldier, the conservatism of the military mind, the reasoned action of the enemy and the fallibility of human enterprise. The conjectures in which one may become involved are manifold yet each must be verified before it may be relied upon. There are in experimental establishments and in various corners of the world certain wheel-cum-track vehicles capable of a certain performance on land. The conjecture that they will be available in the requisite quantities for war, can be filled with automatic weapons, and some driven and fought by one man must not be allowed to form the basis of a military conclusion, before it is verified as being an arrangement of phenomena, i.e., actually a fact. It is well known that such is not the case, yet many look upon it as an observed truth.

The subjective method which is so often used in argument and in council proceeds from observation to conjecture after the manner of the metaphysicist. Such an one allows himself to be impelled by a subjective impulse in a certain direction and is perfectly ready to rely on data and conclusions which are perfectly incapable of verification. Thus the child sees an ogre where in the shades of evening there is nothing but a decaying cabbage stalk and the necromancer in the shades of knowledge sees a pestilence in the wake of a comet. Also the soldier who is entrusted with a military policy seeing a kegresse tractor and a tank, conjectures an army proceeding straight over the face of the earth preceded by vehicles existing only in his imagination followed by a nation in arms towed behind by the string of hope. The conjectures of the one-man-tank and the ability of vehicles to cross ditches, negotiate forests, swim rivers and pass down defended streets, are not verified, neither are they capable of verification. To the disasters awaiting the nation which in its advisers suffer the "realization of abstractions and the deduction of conclusions from unverified inferences as if they had been verified" all history bears eloquent testimony.

¹ "To bring observed phenomena within the ambit of his comprehension," G. H. Lewes.

"When we wake we have a world in common: when we dream each has his own¹."

Each improvement in the mechanical instruments of war opens up fresh fields of discovery and method of operation of each improvement affects the whole body of tactical doctrine. The student is, therefore, led to the conclusion that soldiers must employ the objective method in elaborating the tactics of mechanical transport. The facility with which axioms and hypotheses are accepted as the basis for deductions constitutes a great danger. The better way is to exercise cultivated caution in the verification of all conjectures before the deduction of conclusions; and they must be shallow thinkers indeed who refuse to subscribe to this statement. The business of the soldier is to accommodate the apparatus of civil life to the temporary emergency of war and not to visualize a struggle which conforms to the perilous conjecture of even a partially restrained imagination. At the same time he is faced with the difficulty that caution in probing the possibilities of the future, when grafted on to the traditional disinclination of the military mind to accept change, may conduce to intellectual and mental stagnation in a world of rapid mechanical and scientific change.

¹ Aristotle.

THE EFFECT OF AIR POWER ON NAVAL STRATEGY

By COMMANDER A. F. E. PALLISER, D.S.C., R.N.

On Wednesday, 26th January, 1927, at 3 p.m.

ADMIRAL SIR HENRY H. BRUCE, K.C.B., M.V.O., Vice-Chairman of the Council, in the Chair.

THE CHAIRMAN, in introducing the Lecturer, said: "Commander Palliser, in his naval career, has specialised in gunnery, but recently he has also served in the Naval Air Section of the Admiralty; he is now undergoing a course at the Royal Naval Staff College at Greenwich. He wishes me to say that he did not serve in the Royal Naval Air Service, and makes no claim to special knowledge of air problems other than the interest that all naval officers must take in that subject."

LECTURE.

It is possible that the most scientific way of approaching the consideration of the effect of air power upon naval strategy would be by examining in turn each of the principles of war as commonly accepted, and by an investigation of the effect of air power upon each principle. But this method seems too abstract for my present purpose, particularly as there is so little past experience of the use of aircraft at sea to guide us to conclusions, and I think it simpler to confine myself to the concrete side of the problem in a brief consideration of the functions of naval strategy as affected by air power. It will be my endeavour to deal with naval strategy in general, and not British naval strategy in particular.

The scope of this enquiry has certain definite bounds. The effect of air power in any direction is obviously governed by its means of expression, in other words by the state of development of aircraft. I propose to confine myself to aircraft as they are at present. Any startling future change in their capabilities will necessitate a re-examination of the problem, but it seems probable that future changes will be gradual rather than startling, and will take the form of steady advance in the essential qualities of reliability, mobility, and offensive power. And while the development of aircraft proceeds, the development of anti-aircraft counter-measures will not stand still.

Four main types of aircraft appear to be all that we need consider at present. These types are :—

HEAVIER-THAN-AIR CRAFT.

(i) *The reconnaissance type*, whose main functions are those of observation and obtaining information. Such aircraft may be of the land-plane or sea-plane type and may operate from a shore base or an aircraft carrier or other ship, and at present possess a radius of action of 200 miles¹ or under, or they may be of the flying-boat type working from a shore base, possessing considerably greater endurance, larger and more robust, with a radius of action of 300 miles.¹ All reconnaissance aircraft have this in common, that, while possessing fair defensive properties, they cannot rely on resisting the attack of fighting aircraft unless they are flying in formation. Singly they are vulnerable. Reconnaissance aircraft are essentially day time aircraft and darkness puts an end to their usefulness at sea.

(ii) *The weapon-carrying type*, whose duty is to attack by means of the bomb or torpedo. These aircraft have a radius of action of from 100 to 300 miles¹ and are weak in defensive power. Such aircraft may operate from the shore or from aircraft carriers.

(iii) *The fighter type*, whose high speed and power of offence against other aircraft are intended to fit them for the duty of obtaining local air superiority, thereby enabling other types to fulfil their functions. Their fighting qualities are obtained at the expense of endurance, and their radius of action is not much over 100 miles.¹ This is a point of great importance when it is necessary to provide protection for aircraft of other types, since such aircraft will be necessarily limited in radius of action to that of their escorting fighters. Fighters may operate from the shore, from aircraft carriers, or from other vessels.

LIGHTER-THAN-AIR CRAFT.

The airship, though not so far developed as the aeroplane, gives promise of possessing great endurance and power of remaining in the air. Its radius of action will be measured in thousands of miles as against the hundreds of the aeroplane. On the other hand, it is extremely vulnerable. It therefore appears to have great potentialities for use in the work of reconnaissance over wide ocean spaces where enemy aircraft are not likely to be encountered. The Germans made considerable use of airship reconnaissance at sea during the war, but at that time they had little or no heavier-than-air craft opposition to fear and this is a state of things unlikely to be met in future naval wars.

Before I leave this very brief summary of the aircraft to be considered in relation to naval strategy there are certain pertinent facts that should be mentioned. First, that although, as has been said,

¹ i.e., Nautical Miles.

all types of heavier-than-air craft, except flying-boats, can be operated from carriers as well as from the shore (and most, indeed, from other types of ship as well), yet, as a general rule, ship-borne aircraft are inferior to shore-based aircraft in endurance and general performance. Secondly, where I have given a rough figure of mileage of radius of action, that figure represents the maximum radius under the most favourable conditions. Except in the case of airships and flying boats employed on reconnaissance duties, the limit of effective action of shore-based aircraft seems, therefore, to be reached at about 100 to 150 miles from the coast. Beyond that limit, direct effect upon naval strategy is to be expected only from aircraft carried in ships. Thirdly, all aircraft are in varying degree affected by weather conditions so that their help cannot be counted upon at all times, and their efficiency is dependent upon the existence of adequately equipped bases, either ashore or afloat in carriers; moreover, their use in naval work is subject to the considerable difficulty of accurate oversea navigation. Finally, although many possible uses may be suggested for aircraft carriers yet their total tonnage is now strictly limited by the Washington Agreement, and, since their primary function is that of working with the main fleet, all other employment for them must be regarded as secondary. It is doubtful if any Power will be able to afford to use its necessarily small number of carriers for work away from its Fleet.

One other limitation is obviously imposed by my title; tactics do not concern me; yet the dividing line between strategy and tactics is never a sharp one and the edges are bound to be ragged when aircraft are discussed, on account of their power of extremely rapid movement.

THE OBJECT OF NAVAL STRATEGY.

The object of naval strategy can be simply yet completely described as the control of sea communications. In all wars in which a navy takes a hand this must be its true object, be the navy great or small, be the area over which the communications spread extensive or restricted. But this definition of the object of naval strategy is too wide for my present purpose, and must be amplified by analysis of the different forms of naval activity which are involved in the struggle for control of sea communications. This control can only be fully achieved by meeting and defeating the enemy's main forces in battle, but, when obtained, it brings with it the following advantages to the successful belligerent:—

- (a) The power to stop the enemy's sea-borne trade and consequently to bring economic pressure to bear on him.
- (b) The power of free movement over the seas, especially over the normal trade-routes.
- (c) The ability to carry out overseas operations.

- (d) The power to deny overseas operations to the enemy, which of course includes freedom from invasion in the case of an island power.

The sanction upon which all these powers are based is, as I have said, battle. So that the effect of air power upon naval strategy may conveniently be studied under these five heads—Attack and Defence of Trade, Ability to carry out and to deny overseas operations, and Battle.

ATTACK ON TRADE.

Before dealing with air power and the attack on sea-borne trade, I should like to draw attention to the present state of International Law on this question. International Law at present takes no special account of the employment of aircraft against merchant ships in war, but it is obvious that aircraft share with submarines, and in greater degree, the disability of being unable to "visit and search" merchantmen (except in rare cases) as a preliminary to their seizure. Aircraft have this also in common with the submarine that it is difficult for them to enforce obedience to their orders without using such force as may sink the merchant ship concerned. The rules governing operations against trade are dealt with in the second part of the Treaty of Washington, Article I of which may be summarised as laying down that merchant vessels must be visited and searched before seizure, must not be attacked unless refusing to submit to visit and search or refusing to proceed as directed, and must not be destroyed unless crew and passengers have first been placed in safety. These rules are made definitely applicable to submarines as well as to all other men-of-war. Article IV of this Treaty goes on to bind the signatories not to use submarines as "commerce destroyers" in war. It is, however, important to remember that the Washington Agreement has not yet been ratified by all the signatory Powers.

By an agreement made at the Washington Conference, a Commission of Jurists met at the Hague in 1922-3 to consider modifications in International Law necessitated by the development of new agencies of warfare, and this Commission drew up two draft codes, one dealing with air warfare, the other with wireless telegraphy in war. The air warfare code deals with a multitude of subjects, but the operations of aircraft against merchant shipping is not among them. This came about through lack of agreement among the delegates concerned. Two views were developed, of which the first was that the rules laid down by Article I of the Washington Treaty should apply equally to aircraft as to men-of-war, with the proviso that merchant vessels might be diverted from their course to some convenient place nearby where visit and search could be carried out: the second and contrasting view was that Article I should be applied to aircraft but that "visit on the spot" must be carried out before the merchant ship could be diverted

from her course for further examination. Since agreement could not be reached the Commission could not include any rule in their code to deal with the action of aircraft against merchant vessels.

In view of this, of the fact that the remainder of the code of rules drawn up by this Commission of Jurists has not been officially adopted by the six governments concerned, and of the non-ratification of the Washington Treaty by all the Powers signing, it may seem that this digression on International Law is purely academic. But I have made it with a view to showing how difficult it will be to make direct use of air power in the attack on trade without inhumanity, and how difficult also it will be—leaving the question of inhumanity aside—to do so without becoming involved in anxious dispute with the neutral Powers whose shipping, nationals, or goods will be affected by its use. How, in a given war, a given Power will strike the balance, how it will decide whether the gain to be derived from direct air attack upon shipping will set off the loss, is possibly a question with a different answer for every instance.

Here we can leave the legal side of the question and pass to the practical aspect of air attack on sea-borne trade. I think it is at once fairly evident that the *destruction* of merchant vessels by air action will only be resorted to by a Power that lacks any other means of control of sea communications, though it is certain that aircraft will be used by all belligerents at sea to attack trade in conjunction with surface vessels, and that aircraft will have a considerable part to play in neutralising the means adopted by an enemy to protect his trade.

The greatest effect of aircraft upon sea-borne trade is obviously to be looked for in narrow waters through which certain trade routes must pass without possibility of diversion. The threat to trade will be particularly felt when the shipping route runs for a considerable distance parallel to an enemy coast well furnished with bases for aircraft, since this condition will allow that enemy to make full and economical use of his aircraft's mobility to bring about surprise attacks. A different form of "narrow waters" may also arise where an ocean trade route must pass near or through a group of islands, and in certain cases it might even be found that protection of trade can only be ensured by possession of the islands themselves.

Yet I think that even in narrow waters the extreme difficulty, if not impossibility, of handling a mixed traffic stream of belligerent and neutral trade by aircraft alone will make it certain that effective attack on trade can only be made by a close combination of air forces and surface craft, the aircraft being employed to locate merchant ships and to direct the men-of-war which will divert them to examination centres where they can be dealt with. It is not easy to see how aircraft operating without the close support of surface vessels could effectively divert shipping. Assuming that the initial difficulty of transmitting instructions to a reluctant recipient be overcome, there will remain the

fact that an aircraft cannot stay near a ship to see its orders carried out, owing to its limited endurance and inability to operate at night. The low speed and high endurance of ships will make their control by aircraft alone very difficult.

Once merchant shipping is clear of narrow waters it diverges on to trade routes spreading all over the world and the role of aircraft becomes that of a powerful auxiliary to the men-of-war employed on the work. Carried in the cruisers or auxiliary craft employed in organized stoppage of trade and in a surface or even submarine raider, reconnaissance aircraft will greatly extend the area over which ships can exercise observation. But the use of aircraft by surface or submarine vessels will not alter the fact that merchant shipping is so scattered on the ocean routes that effective attack can only be delivered at or near the various focal points at which it is forced to concentrate. Repeated attack on a focal point may force an enemy to avoid it and divert shipping to an alternative route, which is only another way of saying a longer route. The use of a longer route injures the enemy through the increase of time in sea transit, and, more seriously, through the increase of merchant tonnage locked up on that route. So that, short of the ideal of complete stoppage of the whole of the enemy's sea-borne trade, the most effective use of aircraft in conjunction with surface craft on the trade routes would seem to be in attack against selected focal shipping points. It might even be worth while to employ aircraft carriers on such work even though this will involve the employment of considerable naval forces to protect them.

Generally speaking the attack on trade, wherever delivered, needs to be steadily applied and continuous, and aircraft cannot be expected to replace ships in this attack; on the contrary, the use of aircraft for such a purpose in any other form than that of extremely valuable auxiliaries would probably be uneconomical. Attack on trade at sea may, as I have tried to show, be divided into the broad divisions of attack in narrow waters and attack on the ocean trade routes, but owing to the way in which merchant vessels are scattered over the trade routes, even in narrow waters, the use of air forces as a direct means of attack would absorb a very large amount of unproductive energy and effort. Even if sinking at sight were resorted to the number of ships which would be sunk would not be great, owing to the limited weapon-carrying capacity of aircraft. The air effort which would have to be put forward in order to maintain continuous attack on a trade route would be out of all proportion to the damage likely to be inflicted on the enemy. But there is one place where air attack can be most efficiently and economically used, and that is in the attack of ports where merchantmen congregate. These ports may present many vulnerable points to air attack, the ships lying in them, the sheds where merchandise is stored, the caissons of locks and docks, all these may be reached by day or night air attack launched from shore bases *if within range*, or from carriers

escorted by covering forces of naval vessels. Great ports tend more and more to specialization, and the immobilization of a great port—even if only temporary—might easily cause so great dislocation to some vital import or export trade as fully to justify the air effort put forth to bring it about.

DEFENCE OF TRADE AND THE SHIPPING ROUTES.

Trade afloat is subject to attack by surface vessels, submarines and aircraft, and the means of defence must be varied to meet these attacks either in home waters (including the waters of the Empire overseas) or in the oceans and narrow waters elsewhere. Aircraft were used extensively in the Great War for the defence of trade in home waters, in fact this may be said to be the only purpose for which their use was fully exploited then, and at the time of the Armistice a very large number of aircraft were employed in coastal reconnaissance, anti-submarine and anti-minelaying duties, and in the escort of shipping. Their great value in this work lies in their ability to act as the eyes of the surface vessels employed.

On the oceans also aircraft will have important duties. The hunt for a surface or submarine raider on the trade routes will be much easier for the ships engaged if aircraft are carried, since these aircraft will not only enable a cruiser to cover a much wider surface of the sea than she could unaided, but also will be of the greatest value in the reconnaissance of possible hiding places in indented coasts or island groups; by telling the parent cruiser where *not* to look, they will shorten the operation of search. Trade at sea in war may be scattered, in which case the focal shipping points require protection, or may be in convoy. When focal points lie near friendly shores their protection will be assisted by the use of shore-based aircraft. Men-of-war employed on the protection of focal points or convoys will use aircraft for reconnaissance and possibly as a means of defence against superior hostile forces, but such aircraft will be carried in the men-of-war themselves or even in the merchant ships of a convoy. The use of carriers for convoy work seems definitely uneconomical, though it might be justified for the protection of a focal point. The escort of convoy by airships, as was sometimes done during the last war, is, on the whole, undesirable, since airships are very conspicuous and give away the position of the convoy. The best use for airships in the protection of trade will probably be in linking up one patrolled area with another and seeing that the route between them is clear.

I now pass to the defence of shipping against direct air attack. So far as defence in home waters goes (remembering that "home" waters must include those of the Empire overseas) those air precautions already taken against surface or submarine attack will be partially effective against air attack, assuming that some of the reconnaissance aircraft used are of a type capable of dealing with enemy bombing and

torpedo aircraft, but, at specially threatened points, continuous fighter patrols may have to be employed in spite of the waste of effort involved in this kind of defence. Where the enemy air bases are within reach of our shore-based air forces, attack upon these bases seems to offer the best means of defence of trade, and since these bases must be located on or near the enemy coast, such attacks should not present so much difficulty as those against bases which can be freely moved if attacked. Attack on air bases which are out of reach of shore-based air forces may sometimes be carried out by aircraft raids from carriers. Naval wars of the past afford many analogies in the operations frequently carried out against naval bases from which merchant shipping was threatened.

The defence of distant focal points and narrow waters (such as island groups) may also be effected with carrier-borne aircraft, but as a general rule it will be necessary to establish some temporary air base near them, from which aircraft can operate systematically. An island will be the ideal site for this purpose and it will be necessary to arrange for its quick seizure and rapid defence against air forces and attack by surface craft in small strength.

The question to be decided must always be, is the security of a certain focal point or route worth the effort involved in its defence? And, in answering the question, we must remember that the maintenance of a carrier or seizure of an air base in a threatened locality will always involve a relatively large naval effort, since in either case it is on the Navy that the security of the air forces employed will depend. It will frequently happen that it will be found more economical to abandon a route threatened by intensive air attack—at any rate temporarily—rather than to employ a huge effort in keeping it open.

Finally, we come to the defence of the ports themselves against air attack—in my opinion the most dangerous form of air attack against sea-borne trade. Here the Navy must rely on air forces of the defence and anti-aircraft measures, and can do little to help the defence except possibly by giving warning of the approach of attackers from seaward.

OVERSEAS OPERATIONS.

I turn now to the effect of air power upon naval forces engaged in overseas operations. Here, as elsewhere, the first advantage brought by aircraft is the power of extended reconnaissance ahead of and with the passage of troop convoys and their supporting naval forces. In the initial stage of operations conducted over long distances at sea the aircraft for this reconnaissance will have to be accommodated in carriers as, apart from a limited radius of action, shore-based aircraft will be confronted with the considerable difficulties of navigation over the sea. But in order to obtain full use of aircraft in overseas operations it will be necessary to establish advanced bases for them within striking distance of the objective, and these bases must be provided with personnel,

stores, and equipment for the squadrons operating from them. Although aircraft in a combined operation will be of very great help to the attacker yet their use will throw a heavy extra strain on the naval line of communications, and upon both military and naval protective forces. On account of their comparative ease of protection, I think that islands will prove to be the most suitable places for siting these advanced air bases.

From these bases aircraft will be able to conduct reconnaissance prior to landings and the covering of actual combined attacks. Operations designed to weaken the enemy by direct attack on his bases or concentrated forces can also be carried out, while feint attacks may be useful in preventing the discovery of the point really threatened. Repeated attack on some point vital to the enemy may also have the effect of pinning a large portion of his air forces to it, and thus may cause the place where a landing is to be undertaken to be left comparatively unguarded. Where the distance from the advanced base to such points as these is too great for the radius of action of the aircraft available, aircraft carriers may be used to carry a striking force within reach of its objective, leaving it to find its own way back to the advanced base. When the time comes for the main attack to be delivered the efficacy of naval supporting fire will be largely dependent on the aircraft spotting for the ships' guns, these aircraft being carried in the ships themselves or in carriers, which will also provide the necessary supporting force of fighting aircraft. But the use of carriers in this way will always be subject to the proviso that they can be spared from the naval duties for which they exist, and before using them for shore overseas operations a naval commander must weigh the probability of a fleet action requiring their presence elsewhere.

It stands to reason that the security of the main naval bases in a given area is vital to the success of overseas operations in the area. The security duties of coastal reconnaissance, anti-submarine patrol and convoy escort have already been mentioned when defence of trade by aircraft was under discussion, but in the defence of overseas ports aircraft have other defensive and offensive roles. Where a port is threatened with attack from seaward by ships or carrier-borne aircraft the presence of torpedo aircraft in the port defences may be of great value, provided the personnel of these aircraft are well acquainted with the local conditions and have been trained to work hand-in-hand with the other means of defence. In addition, the threat of air attack—whether sea-borne or from enemy shore bases—will call for a force of fighting aircraft.

The ever-present difficulty of providing sufficient defences at all threatened points, coupled with the mobility of aircraft, suggest a scheme of defence for overseas bases by which aircraft would be stationed in some central position from which they could be moved to the threatened point. This, it may be argued, would prove far more economical than

the locking up of aircraft at definite fixed stations, and the scheme is on the face of it attractive. Yet it would seem that there are very great practical difficulties in the way of such a scheme. Thus it is fairly certain that an alert enemy will endeavour to pin down the defence at some point other than his real point of attack, and as even aircraft cannot be in two places at once, it follows that there can be no certainty of their presence at the decisive point at the critical moment. Adverse weather conditions may delay the start of the air squadrons or hamper their passage so seriously as to cause them to arrive after the attack they are intended to meet has been delivered. Again, the economy produced would be more imaginary than real, since in any case an extensive ground organization, which will call for military protection, will be required at all threatened points and intermediate landing places. Squadrons of aircraft suddenly moved to meet attack will arrive at the scene of action quite unfamiliar with the local situation and conditions, and there is no guarantee that their previous training will have fitted them for their task. Finally, where operations over the sea are concerned, the difficulties of navigation and lack of the essential close liaison with the local defence forces will weigh heavily against an effective defence by air forces imported for the purpose.

DENIAL OF OVERSEAS OPERATIONS TO THE ENEMY.

The converse of ability to carry out overseas operations is the power of denying them to the enemy, and while the most certain way of ensuring this power is by the defeat of his main force in battle, there are other means which may have to be employed. If the enemy refuses to put to sea with his fleet and cannot be forced out of harbour, it will be necessary to blockade him if possible or, at any rate, to keep him contained. The development of defensive forces, especially the submarine and mine, have for some time rendered the old-fashioned close blockade impracticable, and aircraft, though a new factor in the defence, will only add to difficulties already imposed by older weapons. But the maintenance of a distant blockade should be greatly assisted by aircraft giving news of the movement of enemy light vessels, acting in conjunction with the blockading submarines and light craft, and harassing enemy minesweepers and submarine chasers. Such aircraft require to operate continuously in order to be effective, and will therefore want a shore base to work from, though the use of long radius flying boats may enable the base to be kept out of reach of extensive air annoyance from the enemy. If the blockade be eventually broken or lifted, air reconnaissance should ensure that information of the strength and movements of the enemy should reach the commander of the blockading force in time for him to intercept them.

But there will always remain the possibility that the enemy, having escaped from blockade and avoided battle, may succeed in bringing his force to a point suitable for a landing, and this seems to be one of the

cases where air power can do most to help sea power. It may be assumed that such an enemy attack would never be made by more than a raiding force, since nothing larger could exist for any time with insecure sea communications behind it, but it is very questionable whether even a raiding force could be put ashore in the face of heavy air opposition from the shore. The only real prospect of success would seem to lie in complete surprise, and this should generally be denied by the air reconnaissance of the defence.

AIR POWER AND NAVAL BATTLE.

The effect of air power on naval battle is largely a question of tactics and hence not within my scope, but the movements leading up to battle are strategical and in them air power may play a considerable part. Hitherto the greatest difficulty confronting a fleet has been to force an unwilling enemy to leave harbour and meet a decision by battle. Bombing and possibly torpedo attacks by aircraft on ships in harbour afford a hope of getting over this difficulty, and since these attacks will in general have to be continuous, it will be advantageous to employ shore-based aircraft to carry them out, involving once more the existence of an advanced aircraft base. In its absence, cases might arise when the urgency of driving out the enemy or damaging him where he lay would be so great as to justify the use of carriers and their aircraft, but we must look upon this as exceptional, particularly as it will almost certainly involve damage to or loss of the carriers and their aircraft if the attack is really pressed home. A better use for a carrier would be, as I have suggested elsewhere, as a means of transporting towards their objective shore-based aircraft which would return to their base independently after the attack.

The effect of the use of extensive air reconnaissance by both sides—and this effect will be specially felt in narrow waters—will be that early warning of the approach of an enemy fleet will be available. As a result the decision to avoid or seek battle will always be deliberate, and although greatly superior speed may sometimes permit of action being forced on a reluctant opponent, yet on the whole it is likely that the side which will profit most will be that which desires to escape engagement. On the other hand, the torpedo aircraft may modify this effect. In addition to the difficulty of forcing an enemy out of harbour there has in the past been another great difficulty in action itself, namely that of forcing the enemy to stand and fight. Directly battle is joined, or even before, successful torpedo attack by aircraft on important units may pin the enemy and make it impossible for him to break off or avoid action. If this attack be delivered against the enemy's carriers—the floating bases of his aircraft—the resulting loss of air reconnaissance may put him at a severe strategical disadvantage. The commander of a fleet possessing a powerful air arm may in these ways be enabled to bring on a decisive action under conditions of time and place which would have formerly rendered it impossible.

Air superiority will undoubtedly have great effect upon the result of a naval battle, and in actions in narrow waters an advantage will be gained by that side which can bring about effective co-operation with its shore-based aircraft. It follows that it will be undesirable to seek action within reach of the enemy's shore-based aircraft, and at the same time desirable that all friendly coasts, near which action is likely to be joined, should be liberally supplied with air bases so that air support from shore may be in reach of the fleet. At the same time it is easy to attach too much weight to the dangers to be feared or advantages to be gained from shore-based aircraft in battle. It must always be a difficult matter to ensure that a battle will take place in a selected spot, and a battle once begun may quickly move out of aircraft range. Squadrons moved in anticipation of taking a hand in a naval battle will rapidly lose efficiency if long divorced from their maintenance personnel, and will certainly not find it the easiest task in the world to locate a battle in movement, a task, moreover, in which they will be hampered by the difficulty of oversea navigation. These factors must all tend to make effective co-ordination of shore-based and fleet air forces a difficult business. Again, the weapon available is not that which we would choose. The torpedo weapon is at present the most effective for use by aircraft against ships under weigh, but it is not used by the vast majority of shore-based aircraft. The bomb has not hitherto proved very effective against moving ships, and without wishing for one moment to deny that a hit by a bomb might be a serious blow to a ship, yet I would suggest that our present experience shows that many bombs must be dropped to obtain even a few hits. But more important than all this perhaps is the fact that operations by aircraft in conjunction with naval forces demand special training of their personnel, a different training from that given for work over land. It is difficult to see how this training can be given to shore-based air forces except at the expense of their efficiency for the operations for which they primarily exist. A naval battle in progress is a scattered business—bearing but little resemblance to the neat diagram subsequently produced by the historian, the relative position of both fleets engaged is constantly changing and their appearance from the air is remarkably similar, in fact the participation of air forces not fully trained in sea fighting might well be as dangerous to friend as to foe.

SOME GENERAL CONSIDERATIONS.

As a pendant to this brief survey of the functions of naval strategy as affected by air power, I should like to raise a few general considerations bearing on the question, but which, in some cases, do not fall in any particular sub-division, and, in others, may act in part as a summary.

In dealing with each heading of naval strategy the outstanding importance of air reconnaissance has been emphasized and I venture to think this emphasis is justified. The result of the possession by

opposing naval forces of adequate air observation will be to reduce greatly the possibility of strategical surprise, but in proportion to the difficulty of obtaining surprise its value when obtained will be enhanced. At the same time it is well to bear in mind that air reconnaissance is powerless at night, when tactical surprise at any rate will still be possible.

This brings me to the bearing of weather upon air action at sea. The many different functions of aircraft in naval work have been spoken of as if they could be performed under all conditions, when actually their performance is dependent in varying degree upon the state of the weather, while sufficiently bad weather will put a stop to all air activity. Even if the weather is ideal for flying, the effect of previous rain on an aerodrome may prevent shore-based aircraft from leaving the ground. The effect of weather in the literal sense will principally be felt in tactics, but strategy will have to take special account in future of climate and wind and their effect on air operations. The study of gale seasons, prevailing winds, winds blowing on or off a coast, conditions of humidity, fog and visibility, will assume increasing importance, and may even be turned to such account that air operations possible to one side will be impossible to the other.

If we cast our minds back to the naval wars of the past—and particularly those of the eighteenth century—we are bound to be struck with the amount of strategical energy expended on the acquirement and defence of islands. In some cases islands had a definite value as bases, or yielded some desirable and rare product, but more often the strategists of the day regarded islands as valuable counters to be used in the final reckoning of gains and losses when the time came for making peace. It is almost unnecessary to point out the falsity of this idea, since it is fairly obvious to us now that the acquirement of islands, other than those wanted as bases, will follow victory at sea without necessarily contributing to it. Yet I think that in the naval strategy of the future islands will regain their old importance, partly for use as naval bases, but more often as advanced air bases in combined operations, since the effective co-operation of air with naval power will call for a semi-permanent ground organization in a position of comparative security. The success of combined operations will often be affected by the possession of islands or their denial to the enemy.

A very large number of sea duties for aircraft have been suggested, a number so large in fact that it seems clearly impossible that the resources of any nation could provide all of them in addition to its military and purely air requirements, and it will be the task of every nation to decide which are indispensable. For a sea power a Fleet Air Arm is essential to effective naval strategy, but other uses of air power at sea, for instance, co-operation of shore-based aircraft with the fleet and extensive attack on sea-borne trade, will in some cases prove very costly luxuries. The guiding principle must be that of economy of force, and in its application to sea work an important factor will be the heavy

drain on maritime resources caused by aircraft operations overseas, made up of merchant shipping used in transport and supply services, and men-of-war in protection of communications and bases. For a maritime nation the allocation of aircraft to protection of trade must come next to the satisfaction of fleet needs.

CONCLUSION.

The effect of air power upon naval strategy in narrow waters, i.e., those waters over which aircraft can operate from shore bases, is considerable in that it increases the ability of a weaker naval power to inflict damage although it does not confer ability to bring about a decisive result.

Outside narrow waters air power is an invaluable auxiliary to naval power, but has much less strategical effect.

On the whole it provides no short cut to the solution of naval strategical problems, since what it gives with one hand it takes away with the other.

I think the most important lesson to be learnt from this small survey of a very large question is the necessity for the intimate association of the two Services concerned. All air forces that are intended to operate with or against ships in war must be trained alongside their Navy in peace, and this applies not only to the air arm which forms part of a modern fleet, but also to those air units which are destined to be employed in commerce protection, coastal reconnaissance, and anti-submarine and convoy duties. The efficient execution of these duties by air and naval forces working together can only be ensured by the closest co-operation in training, and this is the more necessary since the peace personnel employed upon them will be only a small fraction of that required in war.

DISCUSSION.

DRIVING A HOSTILE FLEET TO SEA.

IMPORTANCE OF SURPRISE IN AN OPPOSED LANDING.

CAPTAIN WILFRID EGERTON, R.N.: Before referring to one or two points which occurred to me in the course of the lecture, I would like to say that, in my opinion, we have just heard an extraordinarily well-balanced statement of a very difficult question, a lecture full of information and instruction for us all. The particular point that I would like to emphasize, which was perhaps rather slurred over by the lecturer, is the tremendous strategical importance of this new weapon for dealing with fleets which refuse, for one reason or another, to go to sea and to accept battle. In all past experience, including the last war, we have spent years, and weary years at that, waiting because the enemy would not go to sea and come to a decision. Of course, that makes for prolonged wars; it makes for

tremendous military efforts, great military casualties and, incidentally, to great boredom on the part of the Navy; but it seems to me we have now got a new weapon which may very well serve to prevent that happening again. One can imagine an enemy's fleet unwilling to go to sea, sheltered under his guns, and those guns so powerful that our fleet cannot approach it; the harbour so defended with nets and mines that our submarines cannot penetrate into it; but, now, the way open for attack by our aircraft. The actual sinking of the enemy's fleet is admittedly the primary job of the Navy, but I noted that the lecturer suggested the best way of dealing with it would be simply for us to take our shore base aircraft to the spot, let them do the work, and fly home. I think that is wrong, or at any rate only applicable in exceptional cases. I think it is primarily the job of our carriers to provide aircraft for such work, and it is the fleet's job to escort the necessary aircraft carriers for that purpose.

In regard to the combined operation of an opposed landing, I feel that the timing of an attack on the enemy's shore cannot be allowed to depend on the necessity for the use of aircraft. It seems to me that, as of old, surprise is of the first importance. If you are first going to carry out air reconnaissance and then make a point of having air superiority at the point of contact, that is to say, on the beach, and so forth, you are going to make this form of combined operation so complicated that you will never be able to carry it out. I think we have to take enormous risks already whenever we carry out an opposed landing. We have to accept the fact that we have to make good the landing and get inland, even further than hitherto, so as to be able to make aerodromes and use aircraft from the shore; but we must not allow the supposed necessity to have them in the air at the time of the first attack to govern the whole situation.

BOMBING AIRCRAFT OR BATTLE CRUISERS.

AIR COMMODORE F. V. HOLT, R.A.F.: I think the lecturer has given an admirable lecture; he has dealt with a most difficult subject, and he has managed to avoid all kinds of snags. It seems to me, however, that there is one important question which he did not touch upon. He has confined his lecture to the present, but I think we must consider the very near future if we are to study the question of the effect of air power on naval strategy. Supposing the Government is limited in the amount of money which it can expend on armaments, and it comes to a question of giving up some form of armament on account of lack of money; supposing, as we claim (I know our naval friends do not agree) that we can hit a stationary battle-ship with a bomb, (I know it is an open question whether we should hit it when it is moving); but supposing we can, the same aeroplane that is kept for attacking hostile capitals or other vulnerable points, can then be used for attacking ports, which Captain Egerton has stated ought to be a naval duty. I cannot agree with that. I own that in battle it might be highly dangerous for a land-trained aeroplane to attempt to attack the enemy's fleet. It is quite possible, at present, that it would hit the wrong ship. (CAPTAIN EGERTON: I did not say that). The lecturer did. I do not think it should be difficult to train an observer, who had been properly trained to attack a hostile capital or any selected target, to hit a fleet in a hostile port. But, supposing, as I say, it is necessary to limit one's expenses in armaments, it might be decided that it was better to spend the money available on the provision of more bombing aircraft, to be used for both purposes than on a battleship which can only be used for attacking either hostile fleets or some other object near the coast.

I believe the cost of a battle cruiser is somewhere in the neighbourhood of £8,000,000, and you can provide, roughly, twenty squadrons of either torpedo-carrying aircraft or heavy bomb-carrying aircraft for the same sum. Supposing the Government decided it was wiser to provide these twenty squadrons of bombers in the place of one battle cruiser, and in consequence, our fleet had a very limited number of battle cruisers and battleships and a very large force of bombing aircraft; and, supposing, on the other side, you get a country such as America, which has no need for these bombing aircraft, which has a full battle fleet, then it seems to me that naval strategy will be very much affected. I only put that point of view forward as a question for discussion. I do not know how it will be affected, but it seems to me that the distribution of the forces must affect strategy.

There are one or two other small points in the lecture that I would like to refer to. I think the lecturer said that the Navy might give assistance in reporting the arrival of hostile aircraft, so that the responsibility for bringing them down when they were attacking a port would rest with the anti-aircraft forces. I hope they will be able to help in that way. I am connected with the scheme of air defence, and as most of you know, our line is some way back from the coast, and we require every warning of approaching attack that we can get. We rely a great deal on receiving from the Navy a warning as to when hostile aircraft are coming over the sea. Such a system is not organized yet, but we hope we shall get that assistance.

LIMITATIONS OF AIRCRAFT. ¶

CAPTAIN K. G. B. DEWAR, R.N.: The last speaker has suggested that bombing aircraft might replace battle cruisers. The answer is that you cannot replace a battle cruiser with bombing aircraft unless the latter can carry out the functions of the battle cruiser. The lecturer told us that the object of naval strategy, which includes the object of the battle cruiser, is to control sea communications. If these bombing aircraft are able to exercise and secure the control which the battle cruiser is intended to do, then they might possibly replace battle cruisers. But we all know perfectly well that bombing aircraft cannot and never will control sea communications, because their limitations are such that they have not the radius of action, nor the power to hit, nor the power to maintain themselves in areas where sea communications are important. Their functions are different, and therefore you cannot replace the one by the other.

The uses to which aircraft may be put in a naval war seem primarily to depend on their actual power to hit and damage ships. That is really the question. The lecturer has told us that aircraft may be used to drive unwilling fleets to sea, to attack trade, to bomb lock gates and ports where shipping assembles. It all sounds quite simple. But the experience of the war indicates that this apparently simple operation is really very difficult. Let us take one or two examples. German aircraft frequently attacked the large fleet of transports which lay off Gallipoli for long periods. A few ships extemporised high angle mountings for 3-pounder guns, but otherwise, anti-aircraft defences were non-existent. On only one occasion did I see a ship hit, and all the bomb did was to raise a cloud of coal dust from the hold of a collier. Similarly, when the "Goeben" ran ashore in the Dardanelles, British aircraft dropped about seven tons of bombs, not on her, but in her vicinity. The salvage operations continued nevertheless, and she returned to Constantinople. The lecturer specifically mentioned lock gates, and said that

aircraft might be used to damage shipping in ports, locks, and so on. I do not know how many thousands of bombs were dropped on Zeebrugge, but I do know that the lock gates were our main objective, for if they could be destroyed submarines would cease to pass. They were never hit. Take the converse case. I do not suppose any place in the main theatre of war was more intensively bombed than Dunkirk. It was one of the ports where stores for our Army were landed. So far as I know the shipping in the port was never held up. All these little incidents—and I could quote many more—may seem extraordinary until you analyse the problem of hitting an object with an aerial bomb. The aeroplane is moving at an unknown speed and in an unknown direction, because it has no exact means of gauging the medium in which it is travelling. To add to its difficulties the slightest deflection from the horizontal renders the so-called bomb sights useless. Not only has this rapidly moving object to navigate itself into a very limited and definite area in the limitless heavens, the position of which will vary with its height and the direction and force of the wind, to say nothing of the course and speed of the target; but if and when it gets there, there is no accurate means of gauging the fact.

When the lecturer talks of all the things which aircraft may do, one cannot help recalling the claims of *le jeune école* with regard to torpedo boats. There is always a tendency to exaggerate the power of new weapons. By spending enormous sums of money, by building huge aircraft carriers, we can, at great cost and labour, get a certain number of aircraft to wherever we may want them, but what they are actually going to do when they get there is quite another question.

INCENDIARY AND POISON GAS BOMBS.

COLONEL D. LAIDLAW, late R.E.(T.), suggested that: Even a very weak enemy might, by the use of incendiary bombs and poison gas bombs, do enormous damage in a restricted area like a port.

ACCURACY OF BOMBING.

AIR ATTACK OF PORTS.

EFFECT OF WEATHER.

AIR COMMODORE E. R. LUDLOW HEWITT, R.A.F.: I would like to start by supporting the previous speakers in congratulating the lecturer on what appeared to me to be an extraordinarily clear statement of the subject. The lecture was extremely well-judged and well-balanced throughout. A speaker referred just now to the question of the accuracy of bombing, but I think it is a fair criticism of what he said to say that his criticism was based on history which is ten years old. In a space of ten years, particularly at the present time, things move very fast, and I do not feel that we should be well-advised to base our defence measures on the assumption that our future enemies cannot hit anything with a bomb. It is simply a matter of practice; it can be done. At the time of the Dardanelles operation, to which the speaker referred, I do not think such a thing as a bomb sight was in existence. Bombing was done in a very haphazard manner; bombs were practically thrown over the side of the aeroplane. But conditions are very different to-day. In our own country we are practically only just beginning, and it is very difficult to say what will be the results when bombing operations are carried out by highly-skilled and highly-trained men, and when as much money, scientific research, practice and experiment have been given to air bombardment as has been devoted to the development of modern naval gunnery.

I rose primarily, however, to refer to two small points which the lecturer passed over rather lightly, but which have been referred to since by Captain Egerton. The first related to the question of the attack on ports. It seems to me that aircraft will exercise their greatest influence in the war on commerce, not by going out and looking for ships at sea, but by attacking them in their ports, where there is no difficulty in finding them. In this way docks and harbours can be blocked by sinking ships in them.

Ports are at present a difficult problem to defend against air attack. I hope that, as the lecturer said, the Navy will be able to give us some warning of the approach of hostile aircraft. What system he has in view for that I do not know, but it is a difficult operation to keep ships at sea watching for the approach of aircraft to any one of the ports within range of enemy attack, and unless we can get warning of the approach of aircraft we cannot interfere effectively with his attack. The defence, therefore, must rely largely on anti-aircraft guns, or upon what the lecturer referred to as the very uneconomical system of keeping aircraft up in the air all day waiting for the possibility of the approach of hostile aircraft, a system which is so wasteful as to be scarcely practicable in war time.

Now, with regard to Captain Egerton's remarks on forcing a battle fleet out of a port; if we can do that with aircraft from carriers it will certainly be a very valuable contribution to the naval war, but I think conditions generally will be against using aircraft carriers effectively for that sort of operation. Carriers are, as everyone knows, considerably more vulnerable than aerodromes; shore based aircraft would have the advantage of weight, of numbers and of protection. But apart from that I, personally, do not think that merely an occasional raid of the "tip and run" variety, which I imagine Captain Egerton had in mind, would drive a fleet to sea. It would have to be constant, continual, sustained bombing. It would have to be the kind of bombing from which they cannot escape, and which they cannot stop. That would, in time, drive a fleet to sea, or damage it so much in harbour that it would not be able to put to sea. But it means that unless we can establish shore bases from which we can operate against an enemy's port, the chances of turning an enemy's fleet out are not very high from aircraft carriers alone, provided the enemy has a large air force and can make use of it from his own shore bases.

The only other point that I wish to refer to is the weather. The lecturer said, quite rightly, that aircraft are limited by weather, but I think it would be rash to over-estimate the effect which weather may have in the future. One has only to watch the daily journeys of the aircraft of Imperial Airways to the Continent in every kind of weather. They are very seldom stopped except by the highest gales, in which ships themselves might be loath to go to sea. Fog stops naval operations almost as much as it stops aircraft. There is no doubt that the air force which is able to carry out operations in the worst weather will have very much the best of it in war.

LECTURER'S REPLY.

COMMANDER PALLISER, in reply: I think nearly all the points have been dealt with by the various speakers who have spoken in the course of the discussion.

With regard to what Captain Egerton said about it being the primary job of carriers to drive the enemy fleet out, I would suggest there is another point to be remembered, and that is the constant question of our limitation owing to the

Washington Agreement. I still think it would be very doubtful whether we could afford to use carriers for anything that is not essentially a fleet job.

I agree with Colonel Laidlaw as to the probable effect of incendiary or gas bombs on a crowded merchant port; but the state of International Law on the subject at the time may have some bearing on the subject.

THE CHAIRMAN :

ADMIRAL SIR H. H. BRUCE, in proposing a vote of thanks to the lecturer, said: With regard to the "digging of the rats out of their hole," which is the expression we heard so much of during the early part of the late war, and which the lecturer laid great stress upon, that is a matter which might be intensified and tried again in the future.

The resolution was carried by acclamation.

At the instance of VICE-ADMIRAL SIR HERBERT RICHMOND a hearty vote of thanks was accorded to the Chairman.

WOLFE'S EARLY CAREER

By CAPTAIN A. C. WHITEHORNE, O.B.E., late The Welch Regiment.

IN recalling the deeds of a great man attention is often drawn to his supreme achievement, whilst many more interesting and instructive episodes of his life may be slurred over. Yet the most profitable lessons of such a life may lie even less in its culminating point than in the story of early struggles or endeavour. This is particularly the case with Wolfe. Whenever his name is mentioned the word "Quebec" flashes across the mind; Louisburg is scarcely remembered, Rochefort never. Yet without these two incidents Quebec might not have fallen, or, at best, its name might have been coupled with the name of another. For it was at Rochefort that the great opening presented itself to Wolfe, which he seized to the full, thereby lifting himself out of the ruck of colonels and becoming known to the man who best knew how to use him.

Wolfe began his military life early, for at the age of sixteen he was acting as adjutant of the 12th Foot at the battle of Dettingen, where his behaviour was noticed by the Duke of Cumberland. A year later he was promoted captain into the 4th Foot, having shown himself to be a first-rate regimental officer. At that time he represented the type of officer that was most wanted in an army which had languished in the long peace of Walpole. In the Rebellion of '45, serving as a brigade major, he was present at both Falkirk and Culloden, at the last battle attracting the eye of Cumberland. He returned with the latter to Flanders, and after Lauffeld, it is stated, that he was publicly thanked by the Duke for his services before his twenty-first birthday!

When the Peace of Aix-la-Chapelle brought the war to a close, Wolfe set about learning the broader aspects of his profession with great thoroughness. In this he was far ahead of his time. "The apathy of the English Army in this respect shocked him. . . . His profession occupied his whole soul and thoughts."

The Duke of Cumberland proving a good friend, Wolfe was promoted major into the 20th Foot, with acting command of the regiment; soon after the Duke obtained for him a lieutenant-colonelcy. "It was probably a unique instance at that time of a young officer by his own merits enforcing recognition, as it were, in the teeth of a rotten system."

He next served in Scotland, a land still gloomily and resentfully licking its wounds after Culloden. It was no congenial task, but Wolfe was never one to shirk his duty because he did not like it, and he insisted that others should follow his example. Another side of his nature came

out in his persistence that the men in the ranks should be properly considered; in those days this was rather the exception than the rule.

He also continued his studies and attended lectures at Glasgow University, whilst stationed in that town; he even engaged tutors for Latin and mathematics. About this time he was turning his thoughts to exploiting the hardy mountain population of Scotland as a recruiting ground for the Army: possibly Pitt's later scheme may have owed something to Wolfe's opinion. Anyhow, when Wolfe moved to Inverness he set himself and his regiment to cultivate good relations with the disgruntled Jacobites. His efforts were not in vain. Later, in the Jacobite stronghold of Exeter, he did the same. In both places one may say he danced the ladies into good humour and they were followed by the men.

Wolfe had always been anxious to travel on the Continent; so after visiting Dublin he went to France. There he was more interested in learning French and in studying the people than in gazing at the concentrated beauties of Versailles, although he was received in audience by the Pompadour and saw her curling her hair! But his stay was short, and he was shortly back in England with his regiment for a spell of four years' duty. But for Wolfe this proved no period of stagnation. It was probably at this time that he read, marked, learned, and inwardly digested the memoirs of Sully, Feuguère and Montecuculi, Turpin de Crissé's, also Puysegur's "*Art de la Guerre*," and Vauban's "*De l'Attaque et de la Défense des Places*." His copies of these works "sprinkled with comments and criticisms" now rest, where they should, in the Canadian archives. Not only did he improve himself, but some more far-seeing fathers of young soldiers wrote to Wolfe for advice on a course of military reading for their sons.

Whilst he was at Exeter the drums of war began to beat from the American shore. Nevertheless, Wolfe was still to possess his soul in patience and also to serve in that expedition which gave him the opportunity to show his head above his fellows.

The Peace of Aix la Chapelle had brought no true rest to Europe; it was "in fact a mere truce forced on the contending powers by sheer exhaustion." England was lapped in the inept administration of the Pelhams, and Frederick of Prussia alone saw the storm that was about to break. Though peace officially reigned, the French now took the offensive against the English on the two flanks of her Colonial Empire. "In India, a French adventurer was founding a French Empire and planning the expulsion of the English merchants from their settlements along the coasts." In America the French "planted Fort Duquesne (now Pittsburg) on the waters of the Ohio. The disastrous repulse of General Braddock awoke Newcastle to his danger; and the alliance between England and Prussia at the close of 1755 gave the signal for the Seven Years' War."

Newcastle was both unprepared for war and constitutionally unfit to carry it on. The French struck hammer-blows reminiscent of the great days of Louis XIV. Port Mahon fell, to be followed by the tragedy of Admiral Byng. Frederick the Great, after his victories at Dresden and Prague, suffered defeat at K \ddot{o} llin. Cumberland signed the Convention of Kloster-Seven. Everything looked black, despondency reigned, and Chesterfield cried in despair: "We are no longer a nation." Fortunately for England, the architect of the new building was at hand. Newcastle decided to collaborate with Pitt, agreeing to manage the patronage and placemen, while Pitt directed policy. Accordingly, in July, 1757, English military policy was again galvanized into life. Speedy action was needed for the year was wearing on. As is too often the case, when sudden necessity is the driving force, that which is done is done badly; the initial expedition to Rochefort was to prove no exception to this rule.

A force of ten regiments had been collected by Pitt in the Isle of Wight. It was known that the exterior commitments of France had depleted any forces that she might have retained for home defence. An intelligence statement had asserted there were only 10,000 men on the coast from St. Valéry to Bordeaux, while the French fleet was blockaded in Louisburg by Admiral Holbourne. Circumstances, therefore, appeared favourable for a descent on the French coast. Pitt's conviction was strengthened by a report received from a young Scotch officer, Robert Clark by name, who had travelled in France, that the fortifications of Rochefort were easily assailable and that the garrison was weak. That report was communicated to Pitt by Sir John Ligonier. The information, however, could not have been very recent or accurate, since Clark had visited France in 1753. Nevertheless, chances of success in this quarter seemed enhanced by the hope that the large Huguenot population of that district might prove half-hearted in their measures of defence. Both these assumptions were to prove fallacious. Finally, Pitt was also convinced that the expedition would prove of value, as Rochefort contained an important dockyard, arsenal and foundry.

His urgent orders for the action of the fleet nearly threw the First Lord of the Admiralty into a fit. Pitt kept the secret of the expedition's destination well, the King and one Privy Councillor alone being cognisant of it. Pitt favoured Conway for command, but the King insisted on the appointment of Sir John Mordaunt, "a veteran who had shown merit in the past, but who had lost his nerve, and was conscious that he had lost it." He also appears to have been broken down in health. Pitt bowed to the King's will and Conway went as second in command; the next senior was Cornwallis, with Wolfe ranking fourth as Quarter-Master-General. The instructions issued to Mordaunt and Sir Edward Hawke, the Admiral who was to co-operate, were "to attempt, so far as it should be proved practicable, a descent on the coast of France, at or near

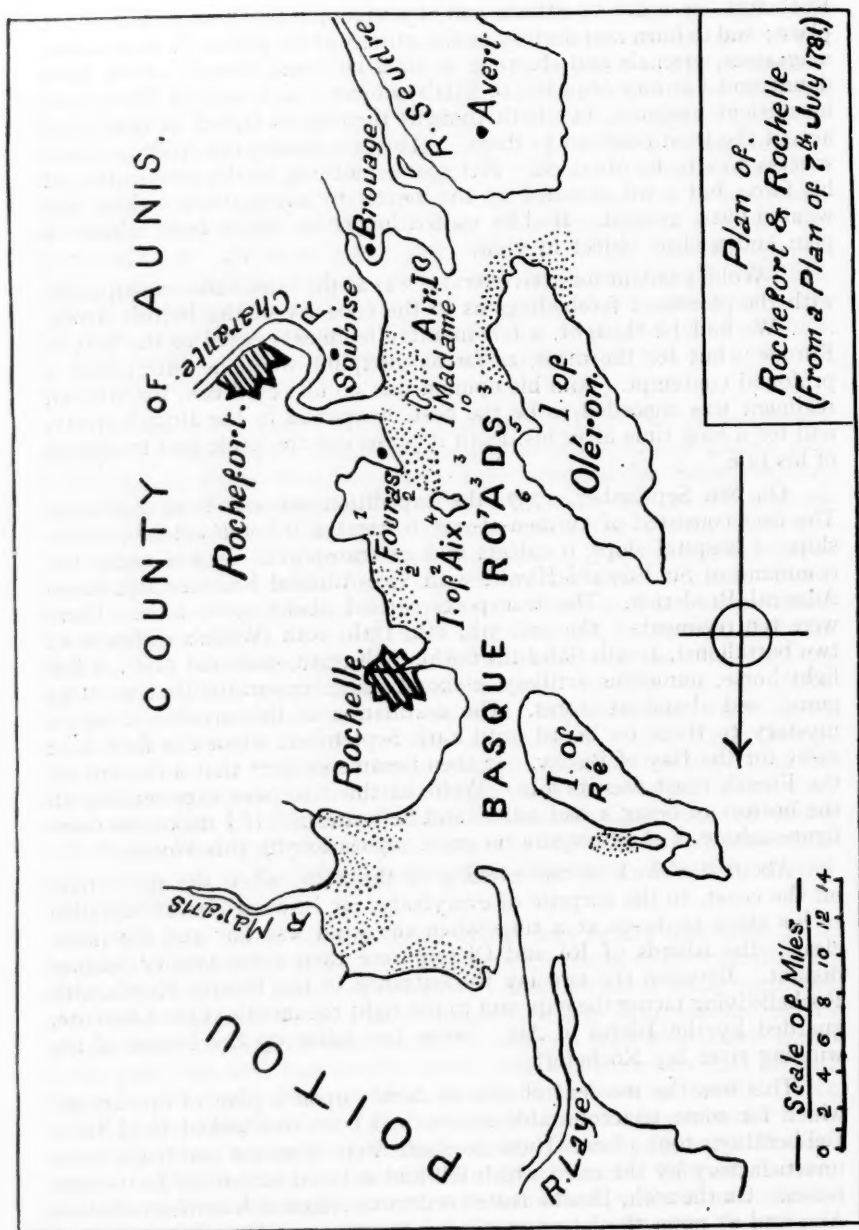
Rochefort, in order to attack and, by vigorous impression, force that place; and to burn and destroy to the utmost of his power all such docks, magazines, arsenals and shipping as shall be found there." Both Mor-daunt and Conway objected to Pitt's project "as based on flimsy and insufficient evidence, but both thought themselves bound in honour to accept the trust confided to them." This was hardly the spirit in which success was to be obtained. Pitt spared nothing in the preparation of his force, but a wit summed up the matter by saying that nothing was wanted but a general. Had he waited longer he might have added—a plan and a clear object in view.

"Wolfe's ardour for active service was at the same time accompanied with the gloomiest forebodings as to the capacity of the British Army. . . . We had, he thought, a few infantry regiments equal to the best in Europe; but for the mass, as far as discipline went, he entertained a profound contempt. And his opinion was no idle cynicism, for his own regiment was conceded to be the best disciplined in the British Army, and for a long time after his death it preserved the pride and traditions of his rule."

On 8th September, 1757, the expedition set sail from Spithead. The fleet consisted of 16 men-of-war, 6 frigates, 6 bomb-ketches, 2 fire-ships, 2 hospital ships, 6 cutters and 42 transports. It was under the command of Sir Edward Hawke with Vice-Admiral Knowles and Rear-Admiral Broderick. The transports carried about 9,000 men. There were ten regiments: the 3rd, 5th, 8th, 15th, 20th (Wolfe's regiment of two battalions), 2/24th (later the 69th), 25th, 30th, 50th and 51st; a few light horse, numerous artillery, elaborate siege apparatus (but no siege guns), and abundant stores. The destination of this armament was a mystery to those on board until 14th September, when the fleet bore away for the Bay of Biscay. It then became evident that a descent on the French coast was its aim. Wolfe at this time was experiencing all the horrors of being a bad sailor, and he writes: "If I make the same figure ashore, I shall acquire no great reputation by this voyage."

About 8 o'clock in the evening of the 19th, when the fleet stood off the coast, to the surprise of everybody, Sir Edward Hawke signalled to his ships to lie-to at a time when the wind was fair and the night clear; the islands of Ré and Oléron were then some twenty leagues distant. Between the two lay the entrance to the Basque Roads with Rochelle lying facing the gap, and to the right the mouth of the Charente, guarded by the Island of Aix. Some few miles up the course of the winding river lay Rochefort.

This was the moment chosen to decide upon a plan of operations, which for some unaccountable reason had been overlooked until then. Deliberations took place. These no doubt were spun out and made more unsatisfactory by the calm which fell and delayed action for forty-eight hours. On the 20th, Hawke issued orders to Admiral Knowles to attack Aix, and at noon the latter proceeded to carry out his orders; but, in



doing so, he chased a two-decked French ship, which escaped into the Garonne, and gave the alarm. What the English lost by this, the French gained. The sight of this formidable armament naturally alarmed the countryside and signal guns and bonfires summoned the people to arms. A surprise had been intended, but all chance of this was now lost ; from this moment the undertaking was doomed to failure.

On the 23rd, a change of wind enabled the fleet to enter the Basque Roads and it was determined to attack the Island of Aix. Captain Howe, in the "*Magnanime*," leading a squadron of five ships and two bomb-ketches, sailed close under the fort on the island without firing a gun, though under heavy fire. When he had reached as near the walls of the fort as possible, he dropped anchor and opened up a heavy fire, well seconded by the "*Barfleur*." The pounding went on for an hour, when the fort surrendered. Some troops were put ashore to take possession of the island. These men disgraced themselves by getting drunk, pillaging, and maltreating the inhabitants, thus proving that Wolfe's fears about the discipline of the force were not groundless.

Howe's action was a brilliant little affair and had raised the spirits and hopes of the force. But this initial success was not followed up. Vacillation reigned supreme, and friction between the naval and military commanders increased. Councils of war were held, whilst the French were obviously strengthening their defences. Wolfe saw that if a blow was to be struck, it must be struck at once. He had no official part in the direction of operations, but his was not the spirit to stand by when something could be done, and only waiting for the man to do it. He induced Sir John Mordaunt, who was an old friend of his, to allow him to make a reconnaissance of the coast on his own account. This being granted, he went and brought back word that he had discovered a point midway between Rochelle and Rochefort where a landing was possible. The admirals and generals considered the scheme and unanimously adopted it after the pilots and naval officers had declared that navigation to the landing point was feasible. But once again hesitation supervened. Fort Fouras, lying on the mainland opposite Aix, was the stumbling block. The military said it was too dangerous to attack by land, and Admiral Knowles stated that it was impossible to get close enough (after rather perfunctory soundings had been taken) to shell it effectively. Wolfe's hopes were shattered, as this new obstacle caused the original plan to be condemned by a council of war. After the expedition was over, Wolfe referring to this time, stated that he was convinced that if a landing had been made Rochefort would have been taken in forty-eight hours.

On the 28th, two days later, after two distinct and new encampments had been seen from the sea, fresh plans were made, by their inception fully proving that Wolfe was right and the council wrong. Orders were given that 1,200 men should be in the ships' boats by midnight. It was intended that this small force should be landed and maintain its positions

for some six or seven hours whilst the boats were reloading and fetching the second contingent. Even to the private soldiers the folly of the scheme was apparent, but they saw that something was going to be done at last, and were only too ready for action. For four hours they sat in the boats on a cold night with a rough sea and an off-shore wind, and then they were incontinently ordered back into their ships; Wolfe says "to the astonishment and disgust of all." Nothing remained now but to hold another council of war and to blow up the fortifications on the Island of Aix. In this performance some of the men were injured. Hawke refused to attend the council and shortly informed the generals "that if they had no further military operations to propose, considerable enough to authorise him detaining his squadron, he would immediately return with it to England." Nothing being proposed, on 1st October the fleet with the army on board sailed from the Basque Roads.

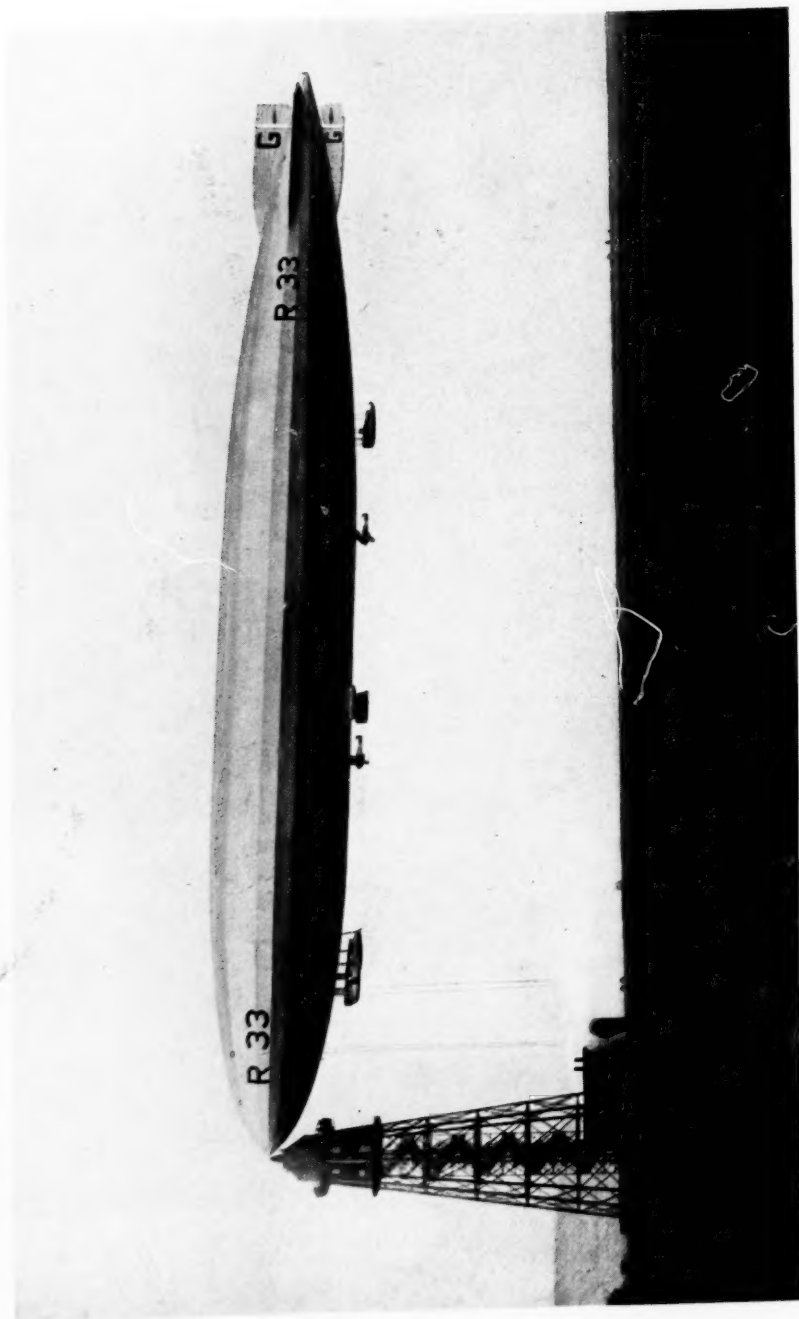
Wolfe in a letter to his father, written on the 30th September, sums up the expedition in the following words: "We lost the lucky moment in war and were not able to recover it. The whole of this expedition has not cost the nation ten men (though over a million pounds), nor has any man been able to distinguish himself in the service of his country except Mr. Howe, who was a great example to us all. We return to England with reproach and dishonour." Sir John Fortescue states that "with such men as Wolfe, Conway and Cornwallis among the senior officers, the only conclusion is that, in the view of military men, no object of the least value could have been gained from the first . . . On the whole it seems that the troops were sent on a fool's errand and that the blame lay solely on Pitt."

A court of inquiry was held into the expedition which cleared the various commanders of blame. But it illumined Wolfe's action; his colonel's commission followed, and Pitt placed him on his list of those worthy to command. In this sentence is summed up the reason why we should remember the Rochefort expedition as we see rising from its dead ashes the glories of Louisburg and Quebec. Is it too much to conjecture that Wolfe himself extracted from this expedition, for all its blunders, more instruction than he received from his other military studies? He himself writes almost to this effect when he states: "I am not sorry that I went; one may always pick up something useful from amongst the most fatal errors." He had there seen a plan initiated from faulty information; incompetence in command; plans left to chance and the morrow; and, above all, friction in an amphibious operation between the Navy and the Army. In his last two campaigns we see the full fruits of his study of all these faults; so we have handed down to us these perfect examples of loyal co-operation between fleet and army. Sir Julian Corbett has rightly declared that Wolfe has left "the reputation of being the greatest master of combined (military and naval) strategy the world had seen since Drake took the art from its swaddling clothes."



MAJOR-GENERAL JAMES WOLFE

From a sketch by Captain Henry Smith (15th Foot), made shortly before Wolfe's death at Quebec. The original was presented to the R.U.S.I. Museum by His Grace Hugh Percy, Duke of Northumberland.



"R.33" AT THE NEW MOORING TOWER AT CARDINGTON

By courtesy of the Sport and General Press Agency.

EVOLUTION OF AIRSHIPS AND THEIR PRESENT POSITION.

By GROUP-CAPTAIN P. F. M. FELLOWES, D.S.O., A.D.C.,
Director of Airship Development.

[While the author of this article wishes it to be understood that the views expressed are purely personal, it is of particular interest in view of the criticism directed against airships lately, in certain quarters.—EDITOR.]

"The fated sky gives us free scope, only doth backward pull our slow designs, when we ourselves are dull."—*Shakespeare, "All's Well."*

"Nothing is achieved before it be thoroughly attempted."—

Sir Phillip Sydney, "Arcadie."

FORTUNATELY the spirit expressed in these quotations was not lacking in the British Governments in 1923-4, when the new programme for airships was formulated. It is only necessary to follow up their early development, interrupted as it was by the war, to understand how much circumstances have interfered with what should have been its natural sequence and to see how essential it was to remedy this state of affairs and to establish their foundations on a new and more enlightened basis.

RETROSPECT.

PRE-WAR PERIOD.—It will be within the memory of all that in Germany, airships, and particularly rigid airships, had reached a stage of development well in advance of aeroplanes prior to the war. Four of these were damaged and lost in the experimental period; but with five out of the original nine remaining 40,000 passengers were carried without damage to one of them, a performance immeasurably beyond the capacity of aeroplanes at that time. That this result was achieved at such an early date becomes all the more remarkable when it is realized that these airships were a type of craft which was very expensive and slow to build as compared with aeroplanes. If any deduction can be drawn from this, which admittedly is difficult, it would seem fair, on such a showing, to say that airships are inherently capable of greater development for transport purposes than aeroplanes.

Concurrently with this remarkable performance by Germany, airships in other countries remained in a comparatively undeveloped state. In Great Britain for instance, we had built and flown several small non-rigids under the ægis of the Royal Engineers, and the Navy had built but not flown their first rigid, H.M.A.S. "Mayfly." The latter ship was unfortunately damaged in her trials preparatory to flight, and as a result of this accident airship development in this country suffered a temporary eclipse. In the light of the very much fuller knowledge of airships and their problems and requirements which is now available, the courage, initiative, and forethought of our early pioneers is shown to have been of a very high order.

In France and Italy the tentative development of non-rigids and semi-rigids respectively was undergoing a deliberate growth.

WAR PERIOD.—At an early stage in the war, Germany, the country then foremost in airship development, amalgamated the knowledge of design possessed by her two leading airship firms, the Zeppelin and Schutte-Lanz, and with this as a basis and utilizing ordinary engineering practice, diluted to a certain extent by rule of thumb methods, she gradually developed her airships to a higher and higher pitch of efficiency.

Owing to the speed of production forced on her by the war, however, she never had time during this period of evolution to investigate scientifically the problems of airship design on the basis of a complete theoretical investigation; but, despite these limitations, rigid airships were produced with a remarkably high performance. Nevertheless, to achieve this, they took risks and there is now little doubt that their later ships, built especially to ascend to great heights and for high speeds, were of so light a construction that they could only be safely handled by very experienced crews¹. In all, they constructed over 100 rigids during the war making, with those built before the war, a total of 114.

Great Britain, when hostilities first broke out, possessed four small non-rigids and three medium non-rigids. Neither the value nor the proper uses of airships were fully appreciated at that time and, though it seems difficult to believe now, an attempt was made to use a small non-rigid to spot for gun fire in France in 1914.

Early in 1915, Lord Fisher came to the conclusion that airships would be a useful anti-submarine measure and ordered their production for this purpose to be proceeded with at speed. The call for these ships was sudden and therefore had to be satisfied immediately and with practically no preparation and research. The design of the first ships was therefore governed by two essentials, simplicity and speed of construction. This limited them in size and also to the non-rigid type, of which we already possessed a little experience; but later, large non-rigids of a

¹ See "In a German Airship over England."—R.U.S.I. JOURNAL, February, 1926.—EDITOR.

more developed design were constructed and produced in order to allow of more extended oversea reconnaissance work.

The pressure to produce rigid airships was not so great, and "R.9," a rigid which had been on the stocks in 1914, was not completed and flown until late in 1916, following her we produced eight other rigids of British design, two of which were wooden ships somewhat after the Schütte-Lanz type. In September, 1916, "L.33" was brought down in England in such a condition that it was possible to copy her design successfully in the two British built airships "R.33" and "R.34," which were completed early in 1919. During the whole period of the war, we, equally with the Germans, were prevented from carrying out the necessary scientific investigation but nevertheless Great Britain successfully constructed 222 airships, all except nine of which were non-rigids. Of these we transferred twenty-four to our Allies.

France and America meanwhile did nothing original in airship construction, the latter adopting British types and the former making very limited use of them at all.

Italy developed the semi-rigid for oversea reconnaissance and for the special purpose of high bombing raids across the Adriatic. With these ships she attained results which were quite up to the standard of the time.

OPERATIONAL USES OF AIRSHIPS IN THE WAR.—The war is so recent and the activities of our own and of the German airships are so well known that it is not proposed to devote space to discussing the general war-like uses to which the various countries put their airships, but their methods of actual operation from their bases and the implications which result are probably not so widely known. In Germany they operated their airships entirely from sheds; to get over the difficulty of taking them in and out in cross winds, certain of their sheds were built to revolve, a very expensive matter, and in other cases they equipped fixed sheds with trolleys running on rails by means of which the airships were held and guided into the sheds. The fact that airships had to be operated from sheds limited their regular use considerably, as they could not be taken out or housed, no matter what facilities were available, in anything but light winds.

We also used sheds to commence with, but later on, when small airships multiplied rapidly, other methods of housing them had to be extemporised. Airships were successfully operated from alleys cut in woods and were moored out to masts. The latter method though partially successful with non-rigids was still really in its infancy at the end of the war. It was also found that airships could ride satisfactorily for short periods at a drogue or sea-anchor or be towed by a surface craft. Small airships have been successfully re-fuelled, re-gassed and re-manned when in tow. Over land it was proved that airships could lie for a time at a tripod of wires suitably laid out on the ground and from this position

they could be hauled down to the ground for re-fuelling, re-gassing, etc., in fine weather.

POST-WAR ACCIDENTS.

Before examining the post-war development of airships, which, slow and tardy as it has been considering their possibilities, is at any rate the bright side of a somewhat dull picture, let us take the dark side. The major accidents which have occurred in the development of airships have been remarkably few and would, almost certainly, have been preventable with more experience. The human being has always had to pay toll for all the advantages to himself which his ingenuity and application have wrung from the secrets of the future.

The American Court which sat on the accident to the "Shenandoah" brought this out very clearly in their finding; they stated that "The disaster is part of the price which must inevitably be paid in the development of any new and hazardous art." The word "hazardous" is comparative and will become as out of place in connection with airships as it is to-day with steamships.

Other interesting quotations from the findings of this Court are: "The final destruction of the ship was due primarily to large, unbalanced, external, aerodynamic forces arising from high velocity air currents. Whether the ship, if entirely intact and undamaged, would have broken under the force existing, or whether prior minor damage, due to gas pressure, was a determining factor in the final break-up, are matters which this Court are unable to determine." In an endeavour to economize helium, 50 per cent. of the gas valves which relieve the pressure in the cells had been removed after the ship was built. This has since been ruled by the Court to have been an unwise measure and is a possible, if not probable, primary cause of the break-up of the ship. Again "although subsequent events showed that a change of course to South when suggested by the aerological officer would have been advisable, the Commanding Officer's decision to maintain his course was a matter for his decision only, was made on his best judgment after discussion and consideration, and was based on the facts and conditions as then known and observed." In other words, had more experience been available, the Commanding Officer would have altered course.¹ "The Court concluded that although it is indicated that a rigid airship such as the 'Shenandoah' can probably be destroyed through external aerodynamic forces in unusual meteorological conditions, such a conclusion does not, therefore, throw doubt upon the safety and utility of rigid airships, to a materially greater degree than does the fact that other types of craft for navigation in the air or on the water are likewise subject to destruction through unusual dangers which cannot invariably be foreseen and provided against." Their findings in fact indicate that

¹ See "Charting the Upper Air."—R.U.S.I. JOURNAL, Nov., 1925.—EDITOR.

had more experience and knowledge, both in regard to the construction and operation of airships, been available such an accident would not have happened.

The other two major accidents which have occurred since the war are those to the British "R.38" and the French "Dixmude." The former was designed not only without the full knowledge which has now become available, but also in an endeavour to attain much greater heights than had been previously achieved. As little weight as possible was therefore put into her structure with the consequence that she failed when being manœuvred at high speed in the dense atmosphere near the ground.

The "Dixmude," a lightly-built German ship of high performance, was lost under circumstances which are extremely obscure. At the time, the Court of Enquiry attributed the loss to lightning, but similar ships have been struck so many times without damage as to render it at least possible that the accident may have been due to a cause somewhat similar to that of "R.38."

There are two other accidents which have occurred since the war with rigid ships, in both of which the ships broke away from their masts and both got safely back to their sheds; and the fact that they did so, in so badly damaged a condition, emphasizes the reserves of structural strength inherent in an airworthy airship. It is extremely doubtful if a sea vessel equally seriously damaged could have weathered such gales. The American ship the "Shenandoah" broke away due to the combined effects of a failure in her mooring gear and in her fin structure; both were afterwards modified. The British ship "R.33" was not originally designed for mast mooring, but only adapted for this purpose. She broke away during a heavy gale from the mast at Pulham, the first experimental mooring mast erected for rigid airships in this or any other country. On the experience gained subsequent enquiry indicated that neither in the mast-head fittings nor in the bow of the airship had a sufficient margin of strength been allowed.

POST-WAR PERIOD.

After the war there was a general dislocation of airship activities. The expense of maintaining large airship services with their accompanying necessarily extensive ground organization was too great to be faced in the straitened financial conditions then prevailing in all countries. It gradually became clear in the minds of the British authorities that, however desirable a service airship organization might appear, by far the most practical method of developing airships, plus their necessary ground facilities, throughout the world, was to induce commerce to take them up. The governing reason why in most countries they could not become commercially practical immediately after the war was because at that time they could only be operated from sheds. This was a very serious limitation because an essential feature of commercial conditions must, of necessity, be regularity of service, yet the average meteorological

conditions do not permit of regularity under such conditions. It was therefore decided to continue the development of the mooring mast.

In 1919 it was proved that a rigid airship could lie satisfactorily at a mooring mast under all ordinary weather conditions, but it was not until 1921 that a satisfactory method of flying an airship to a mooring mast was evolved. Actually what was achieved was to prove that an old airship, which was not originally designed but only modified to moor at a mooring mast, could fly to and be secured at a mast in winds of 30/40 m.p.h. and could lie at a mast in winds of over 50 m.p.h. There is no doubt that with practice and experience and with modern airships built to moor at modern mooring towers these figures will be greatly improved upon, so much so that it will only be in most exceptional circumstances that an airship will not be able to make fast at her intended destination and rarely will it be necessary for her to slip and ride out a gale in the air. Thus, the difficulty inherent in sheds having been overcome by the development of the mooring mast, or as it is now called mooring tower, airships would probably have secured an earlier development in this country had it not been for the unfortunate accident to "R.38."

Since these trials America has erected five mooring masts across the United States and is now erecting a sixth. There is also one on a converted oiler and one at Pearl Harbour in the Sandwich Islands. We have erected two mooring towers, developed in the light of the experience obtained in 1921, one in England, one in Egypt. As a result of the Imperial Conference, the erection of mooring towers has been projected, one in Canada, one in South Africa and one in India; Australia and New Zealand are considering the question of following suit in those Dominions. We have also, recently, built one big shed in England, a second is projected and we are building a still bigger shed in India and are providing the necessary gas and fuel facilities at our new airship bases.

CONSTRUCTION SINCE THE WAR.

In the matter of construction since the war comparatively little has been done. Germany has built two rigids, the "Nordstern" and the "Bodensee." The latter, a small passenger ship of approaching 1,000,000 cubic feet capacity, or say 30 tons displacement, carried a total of about 2,450 passengers in 103 trips, without accident. She has also completed the "Los Angeles" for the United States, a ship of 2,600,000 cubic feet capacity. It is rumoured that she has now designed a ship of about 3,750,000 cubic feet capacity and is building a ship of 2,000,000 cubic feet capacity, with which it is intended to test out the route between Spain and South America, starting with that to Teneriffe, as a preliminary.

We completed "R.33," "R.34," "R.36" and "R.38." The first two airships have carried out some notable work. Amongst other per-

formances the "R.33" has carried out all the experimental work involved in an extensive programme, while "R.34" has crossed the Atlantic both ways.

The period between the closing down of airships and the commencement of the new programme was devoted by the Aeronautical Research Committee to a close investigation of the aerodynamic and static forces and the resultant stresses and strains set up in the structure of a rigid airship. They also investigated certain questions which were in doubt when "R.38" was constructed, in regard to the strength of the structure of rigid airships, both by mathematical analysis and also by actual model tests.

In 1924 the new programme was approved which included a research and experimental period to be followed by the building of two 5,000,000 cubic feet ships, each ship to carry 100 passengers, luggage and mails, together with the erection of the necessary bases in England, Egypt and India to enable these ships to be tested. The first step which was taken was to endeavour to confirm the model results obtained by the Aeronautical Research Committee by full scale tests in flight on "R.33" and in other full scale structures on the ground. These latter included a complete section of one of the new airships. This has now been satisfactorily completed and shows that the model tests were, to a very large extent, accurate. The design of these two new ships is now approaching completion and their construction has commenced.

The climax of the original 1924 programme will be the flight of the two new airships to India. To enable them to carry this out safely it has been necessary to devise a very complete meteorological organization to cover the route from England to India, this organization has now reached an advanced stage and the conditions to be met with over that route have been meticulously analysed since early in 1925. By the time the ships actually fly, fully adequate preparations will have been made.¹

At the Imperial Conference it was decided to carry out Dominion demonstration flights and to send an airship mission to select the bases for these flights. It has, therefore, also been necessary to subject the routes England to Canada, England to Australia and England to South Africa, and the probable bases in these countries to a tentative investigation in order to enable this to be done. This investigation will no doubt be amplified and the necessary meteorological and wireless organization completed before the bases are made ready for operation, but as these flights will be carried out at a selected time the organization need not be of the extensive character which would be required for a regular route. These flights will afford valuable new information in regard to the conditions which are likely to be met in crossing the tropics.

¹ See Map facing page 80 of "The Approach toward a System of Imperial Air Communications."—H.M. Stationery Office. 5s. od.—EDITOR.

Another interesting and important investigation which is taking place at Cardington by means of special devices is the analysis of the structure and rate of change of speed and direction of wind gusts in order to appreciate the stresses to which airships will be subjected when riding at a mast. The airship when at a mooring mast will be fitted internally with self-recording instruments which will warn her Captain when the strains in the structure are approaching a critical point and, therefore, when he should slip and ride out a gale in the air.

From the Service point of view two things have been demonstrated. The first is that airships can carry and drop off fighting aircraft without difficulty. The second is that aeroplanes can hook on to airships in flight; though a system of doing the latter has still to be satisfactorily standardised and will require time. When the system of airship bases throughout the Empire is established both of these developments will have very important results.

The United States have continued to develop non-rigids slowly, and have built a semi-rigid with the assistance of the Italians and also one rigid with our assistance. They have also received the "Los Angeles" from Germany. Her cruise of about 5,000 miles from Friedrichshafen to Lakehurst in eight-one hours was a good example of what airships are capable of doing. Now they, in a rather deliberate fashion, are continuing to carry out full scale research work on airship design and experiments in the operation and handling of airships. They also propose to build two new rigids of 6,000,000 cubic feet. The construction of one of them is due to commence during the fiscal year, 1927-28, funds having been voted. In connection with the construction of this airship they have recently announced an open competition for the design, to a laid down specification.

The Italians have continued the development of the semi-rigid and have under construction, amongst several smaller ships, a ship approaching 2,000,000 cubic feet in capacity, destined it is believed, for commercial work. Perhaps the most remarkable performance to the credit of the Italians was the flight of the Italian "Norge," a semi-rigid ship of 650,000 cubic feet capacity in 1926 over the North Pole. The total flight from Rome to Nome covered a distance of 6,175 miles.

The French have merely laid out a ground organization for the time when airships develop, otherwise they have concentrated all their aeronautical energies on the development of aeroplanes.

The Japanese are maintaining a very small airship service and have recently purchased a small semi-rigid from the Italians.

The Russians, it is believed, are also about to purchase a non-rigid from the Italians.

From this short survey, it will be seen that Great Britain, Germany, the United States and Italy are the only countries seriously pursuing airship development, although Spain and the Argentine have shown

themselves ready to take an interest when commercial airships become available. The explanation of this state of affairs is not far to seek. Airships, despite their many advantages, when developed, have at the moment one main difficulty: to overcome this entails the expenditure of time and money. The seaplane can fly from one place to another and only requires very small additional ground facilities, in fact it only requires a buoy to lie at and facilities to refuel on arrival, provided the weather or the situation of its base are favourable. Aeroplanes require more than this, as it is necessary for them to maintain a chain of landing grounds and aerodromes, and desirable to have moderately good country to fly over on their routes. Airships, however, require much more elaborate ground facilities in the form of sheds or mooring masts and an extensive meteorological organization to enable them to operate safely between different parts of the world. Nevertheless it is anticipated that the time and money which will be required to provide these facilities for airships will be fully repaid in the course of time, just as docks, quays and harbourages have been justified in the case of steamships.

If the expense of setting up facilities for airships is compared with the expenditure of providing corresponding facilities for seagoing vessels, the comparison will be found to work out very largely in favour of the airship. It is none the less necessary to recognise the fact that an adequate ground organization is essential before airships can be satisfactorily established as a means of world transport comparable in safety and reliability to that of seagoing ships. It is for these reasons that the present British programme has been developed on the lines which are now being pursued.

THE FUTURE.

In this country it has been realised that before commercial undertakings can properly be asked to participate in the development of airships, the necessary research work to enable airships to be designed and constructed with due regard to all the factors involved must be undertaken by the British Government and also that certain experimental and operational data will have to be collected both by the British and Dominion Governments.

Such matters as the minimum meteorological organization and their complementary communications required to make a route safe for airships, the number of masts to be erected on any route, the number of ships which can be safely based on a shed, the qualities which will be necessary in airships when flying to and mooring at towers under tropical conditions, the reserves of fuel which are necessary for their safe operation, and the quantities of gas, fuel, etc., they will utilise under normal conditions in the different areas in which they are operating, the regularity of service they can give and many other practical problems in regard to the handling and the maintenance of the ships and their

crews, will probably have to be, at any rate partially, cleared up by the Government before commercial interests will participate.

As far as the technical problems in the construction of airships are concerned, now that there has been time to investigate them, there does not appear to be any reason why airships should be long delayed before becoming truly commercial. The heavy oil engine for airships, a most important development towards eliminating risk from fire, is in sight and will actually form the power plant for the Government built airship. The question of the lining for the bags to contain the gas is really the most important problem to be solved and it is hoped that in the near future a satisfactory and reliable synthetic material will be produced which will be cheap and easy to manufacture. Until this is done, and no reason is seen why it should not be done very soon, airships have to depend upon the supply of gold beater skin for this purpose. No shortage exists at present but it would arise eventually.

It is, of course, essential to make every endeavour to ensure that the process of building up and maintaining an airship fleet shall not be unduly expensive. Undoubtedly the way to do this is to build and get into operation as many airships in as short a time as possible, as it is only by having numbers that cheap construction and cheap operation become possible. The problem of the future will therefore be to select the right moment in the development of airships for this large expansion. Commercial enterprise, if it is to seize this moment boldly, will undoubtedly require encouragement and, to provide this, probably the best thing is to do what the British and Dominion Governments have commenced to do, that is to shoulder a considerable proportion of the initial expenditure, particularly that part concerned with initial research and experimental construction and operation and with the setting up of the ground organization.

It would, therefore, appear desirable for the Governments concerned, at the correct time, to follow up their present policy and to provide the complete ground organization to include masts, sheds, gasplant, fuel storage, etc., and the requisite meteorological and wireless facilities, throughout the Empire to enable the necessary routes to be developed when, and if, the present experimental constructional and operational programme is successfully completed. If the Governments concerned are prepared to do this and our big shipping or transport organizations will come forward at the right moment in a large way and operate the number of airships which will be required on the various world routes, the end in view, namely, cheap construction and operation of airships at the earliest possible moment will be secured. Given such a state of affairs no reason is seen why big commercial airship organizations should not be successfully dovetailed on to existing shipping and other transport companies in the comparatively near future in such a manner as to increase the dividends of the companies concerned. Views in confirmation of this opinion have, it is believed, been expressed by important shipping interests.

ADVANTAGES OF AIRSHIPS.

To those who have only flown in aeroplanes or seaplanes or who have experienced the discomforts possible in sea voyages in the smaller type of passenger ship, it is difficult to convey in mere words the grateful feeling of stability and stateliness which is experienced in flight in a large airship of the "R.33" class, and therefore it is much more so to endeavour to forecast the sensations which passengers will experience in the new and much larger airships now being built. Perhaps the best analogy is a big liner on a smooth sea far from shore. The space the new airships (they are about 730 feet long and 130 feet diameter) will have available for accommodation will be very large, the biggest room in "R.101" is about 60 feet by 40 feet. They will also provide all the ordinary amenities of passenger ships and in the opinion of those who have flown in airships will become a remarkably popular mode of travel.

In conclusion, it is perhaps interesting to visualise the results airships may have upon the communications of the British Empire, and to do so it is as well to cast the mind back to pre-steamship days. In those days it is no exaggeration to say that the early development of the steamship as an ocean-going vessel was scoffed at by all sound and sensible men. It was only the visionaries who believed in them and by their persistence in their belief they have in the matter of time-distance, as it were, taken the world into their hands and compressed it to a quarter of its former size. If airships fulfil their promise they may eventually repeat this wonderful achievement, while even now they can reduce the present time distance factor by at least a half.

Translated into terms of geography what does this mean? It means that in so far as passengers and mails are concerned Australia will be where India is, India will be where Egypt is and Canada will come half across the Atlantic.

If this estimate of the possibilities of the airship is not exaggerated the future may prove that the two great egg-shaped structures now under construction in the sheds at Howden and Cardington contain the germs of a truly epoch making development in world amenities.

THE ORGANIZATION OF THE FRENCH NATION FOR WAR

(Specially contributed from a French source).

FRANCE is at the present time in the thick of military reform. The ultimate scheme of reform comprises the adoption by Parliament of four fundamental Bills, namely, those dealing with the Organization of the Nation in time of War, the Recruiting of the Army, the General Organization of the Army, and lastly, with Cadres and Effectives.

The first of these Bills, that which concerns the Organization of the Nation in time of War, has just passed the Chamber by 500 votes to 31 (the latter being Communist votes). The Bill has not yet been definitely adopted, as it has still to pass through the Senate, which may introduce some amendments into it, so that the time is not yet ripe to examine it in detail. However, without going so far, it is possible even now to bring out the general principles which regulate this Bill and the new ideas which proceed therefrom.

First of all the Bill is not a bill drafted for the occasion. For a long time past it has been realised in France that a complete re-organization of the Army was necessary, a re-organization which would involve important measures of co-ordination of an administrative and economic character. As far back as 1921, the Superior Council of National Defence, which is a body representative of all Ministries, was asked to prepare the new organization and it is its permanent Commission and Directorate which from that date have elaborated the Bill that has just passed the Chamber.

The general idea of the Bill is that, henceforward, war is not the business of soldiers alone, even if they are reinforced by the young element of the civilian population. War brings out all sorts of problems: economic, political, social, moral, among others, which necessitate the utilization of all the resources of the nation in men and supplies. War must then be *complete*. It does not follow from this fact that the entire nation should, or could, be submitted to a *permanent military* organization. It would be irrelevant to do so in time of peace with a view to preparing for all the eventualities of war; even in materializing such a transformation at the beginning of a conflict, one could not, without ill result, remodel the entire national organism. All that is necessary is to co-ordinate, with a view to defence, the action of all authorities and of all national groups under the management of the Government and according to a general plan, elaborated in advance, but which should admit of sufficient elasticity and be always kept up to date. The Bill

is only a statement of principles and to these will be incorporated detailed provisions, some of which exist at the moment, but which will be determined by special laws or decrees.

Henceforward, under the Bill, all French people and all inhabitants of French territories, without distinction of age or sex, and all legally constituted groups are liable to take their share in the task of National Defence. Mobilization will thus henceforward include everybody with a view to providing effectives for the Army, to furnishing the vital needs of the civilian population and to maintaining in the country an economic and intellectual activity which may safeguard the future. The plan of that mobilization will be drafted, under the direction of the Superior Council of National Defence, by the various ministries and by specific "mobilizing elements" representing in time of peace the nucleus of new ministries whose creation is foreseen in time of war.

It is easy to see the changes that this idea brings into the system which was considered up to now as a considerable progress in humanitarian law: the distinction between combatants, who alone were affected by the laws of war, and consequently by their consequences, and the non-combatants who were protected by the Law of Nations. In the future there can exist no distinction. Everybody is a combatant, those who manufacture armaments as well as those who make use of them. It is the nation in arms, everyone for the good of the country filling the situation best fitted to his ability; it is the return to integral war such as was practised by the barbarous hordes of ancient history, or even such as is practised nowadays by certain small States, such as Montenegro, where all the men fought while the rearward services were carried out by women who even went so far as to ensure the replenishment of ammunition to the firing line.

Though that idea had not been openly uttered during the last war, it is certain that the belligerents acted as if it were admitted, and one loses count of the bombardments effected by gun or aeroplane, not only on war factories but even on unfortified towns unconnected with any military activity.

The new Bill does not made any innovations, it only explains logically the most recent lessons of the war; it has openly stated what other nations have implicitly admitted, and all that they practised in the course of the last war.

In the same manner that individuals are mobilized for the service of the nation, animals, property and merchandise may be requisitioned, not only for the use of the army, as of old, but for any service pertaining to the national existence. It is the distraint of all economic life for the profit of the State. In pursuance of the principle that every man has to put his services at the disposal of National Defence and that all resources of the country are to be sacrificed to that object, all profit-making is absolutely prohibited. Fair salaries and compensation are

the counterpart of all requisitions, but they are not to constitute any source of wealth. At the utmost, in certain cases, bounties will be given to stimulate production. Besides, requisition is the last resort ; a private agreement is always to be preferred but its conditions should not be better than those which would be contained in a requisition.

The new Bill tries also to settle the knotty question of the respective powers of the Government and of the High Command. It is the Government, or rather a small fraction of it, called the " War Committee," which wields the supreme command, and it is for that purpose assisted by the Superior Council of National Defence.

As for the High Command, it only directs the military operations under the control of the Government. Each Ministerial Department will act in the same manner in its own sphere. A regional organization is foreseen, in which the command will be concentrated, in each administrative district, in the hand of a man who may be either a military officer or a civilian.

Another serious problem is the rôle to be played by Parliament. The following solution has been finally adopted : Parliament will still sit, but every one of its members will have to *choose once for all*, between his parliamentary and his military duty, if he is liable to be called up to the colours. If he elects to serve in the field he may delegate his voting powers to a colleague.

Lastly, defensive measures are foreseen to protect the mobilization. Those measures have a military and economic character. They relate to fortifications, transportation, means of communications, and so forth. They are related, to a certain extent, with the general organization of the Army which will be determined by another law.

This Bill is the most complete effort made by France up to now, with a view to organizing the *defence* of her territory. It must be noticed, however, that if it increases the means of action of the Government in time of war, it only places those means at its disposal for a strictly *defensive* purpose, or as it expressly stated in the Bill, *in case of obvious aggression, or in the cases foreseen by the Pact of the League of Nations*. It is, besides, quite obvious that the more there are people to suffer directly through war, the more opposition there will be to it and, consequently, the more chance of preventing it.

CONCEALMENT FROM THE AIR

By FLIGHT LIEUTENANT A. ROWAN, R.A.F.

SINCE the Great War air-power has assumed a paramount importance ; so much so that it is being recognized as now constituting a weapon likely to rob commanders of that vital factor necessary to success in war, the element of surprise. This being the case, it is not only interesting but also important to examine how far it is possible to render this power of the air innocuous.

Now, if a man proposes to commit a crime in a room overlooked by another, he will undoubtedly take the precaution to pull down the blind. If a light is necessary for him to achieve his end, he would probably close the shutters as well. In modern war there is an onlooker, the reconnaissance pilot, watching the belligerents committing the "crime." Of the latter, he who has devised efficient "blinds" and "shutters" may still retain his liberty of action and consequently can enjoy the element of surprise. But let us again regard the question from a different standpoint. Having invented a new aggressive arm, a wise inventor turns his attention to the antidote, for no innovation is enjoyed exclusively for any length of time by any one belligerent.

Probably the first instance of camouflage is that of the Wooden Horse of Troy used by Ulysses and made by Epeios. The element of surprise was perfect. An examination of what was done a good deal later, namely, on the Western Front, will lead us to the conclusion that the principles involved remain the same in all classes of warfare, in every part of the earth.

It is interesting to note that already in 1911, Bernhardi, referring to German preparations for war, lays stress on the need to "develop the means of concealing the attacking forces." The coming of the aeroplane had made it patent even at that date that special concealment would become a necessity. Again, in 1913, the Swiss, in their annual manœuvres, attempted to camouflage their guns. There can be little doubt that the idea emanated from Germany, and that experiments were made at her instigation. Germany had foreseen the functions of the flying machine long before 1914, and made full use of her own Zeppelin services in this respect.

Turning to General Ludendorff's "War Memoirs," where, in Vol. II, he speaks of the March (1918) offensive, we read: "The divisions had at first been distributed behind the front of attack, but were now

crowded together in anti-aircraft shelters behind the jumping-off places in our foremost line. *This concentration of 40 divisions had not been observed by the enemy.*" Here we have one of the first indications that means exist by which a large body of men can be concealed from the air. In this instance the means were artificial. In a no less famous instance in Palestine, Lord Allenby was able to hide five divisions in the orange groves north of Jaffa. It must be borne in mind that we had air superiority, but not supremacy, since a Turkish reconnaissance machine had reported "no unusual activity" the day prior to the attack.

Such a concealment of large numbers makes it clear that strategic camouflage is possible. The importance of this fact is great. On the one hand, it gives the high command the power of carrying out an unmolested concentration, whilst retaining the element of surprise; on the other, it compels the Air Force to enter into the means and ways of penetrating the various disguises which may be adopted. But there is yet another factor which continuously tends to increase the importance of camouflage. Whatever the opinion of the jurists may be with regard to legitimate "military" objectives in their relationship to chemical warfare, gas, as a weapon, has come to stay. If adequate camouflage can render it possible to secure a large concentration of troops at their "jumping-off" place, an important object will have been achieved. Without the protection afforded by camouflage such concentrations will become impossible, since the aeroplane and gas combined will discover the enemy and a gas bombardment will ensue. We cannot confine ourselves, therefore, to tactical camouflage alone, but must examine the possibilities of strategic camouflage also.

Before examining the principles underlying concealment we have certain points to consider. It is obvious at once that concealment may be divided into two distinct categories:

- (a) Natural;
- (b) Artificial.

Natural Camouflage.—In referring to this type of camouflage we are dealing with everything which is found in nature capable of affording concealment. Of primary importance is shadow and its correct use. To court all shadows except one's own, to make use of nature's lines of demarcation, to understand the colour values of surface background; these are essential factors in the employment of natural concealment.

Owing to the qualities inherent in natural camouflage, its use is far more suited to tactical concealment, and to a war of movement. Artificial camouflage needs money and time; natural camouflage needs neither, and ultimate success in its employment will be given to the commander with imagination, which will ensure variety. In the case already quoted, relating to the orange groves north of Jaffa, concealment was secured by making use of foliage and by rigid discipline. But

convenient orange groves are rare, and useful looking woods may be death traps, as they can be sprayed with gas before the troops use them ; further, the airman is taught to regard all woods with suspicion and gives them his special scrutiny. A commander who commits himself to a definite line of action, depending for its success on actual concealment from the air by nature's means, is thus running a grave risk.

Artificial Camouflage.—In dealing with this form we are treating with artificial means which involve :

- (1) The proper use of natural tone values ;
- (2) The correct understanding of structure and cast shadow, i.e., the elimination of shadow by alteration in structure.

Artificial concealment, therefore, means expenditure of time and money. It is most suited for back areas and for stationary warfare. A field may be raised by painting canvas 7 feet high, a method adopted by the Germans to hide 2,000 men outside Antwerp in 1914. A structure of this nature is practically indistinguishable from the solid ground it covers. Provided the tone values are correct even the camera will not detect the fraud. The work, however, is tedious, expensive and must be completed unnoticed. In this way, however, literal concealment has again been secured, and, in strategic concealment, it has its value.

Should actual concealment then be the rule ? Is it essential in attempting to hide from aircraft ? The obvious answer is "No." In both the methods discussed one fact has been elicited, that total concealment is only possible under propitious circumstances in a particular instance, and not as a general rule. There is, however, a common principle underlying both natural and artificial concealment, and that is deception. An unreal image presented to the observer's vision, a mockery, a chimera, which will cause him to bring back a misleading report. Is it essential to hide in order to secure such an illusion ? Once again the answer is "No," provided the deception is good enough to prevent suspicion being aroused. The observer in the machine is, after all, a human entity, and, therefore, the surest foundation on which to build a general plan of deception, is a knowledge of psychology. If on the earth below him, the observer sees that everything appears to be as he would expect to find it, then no suspicion will have been fostered in his mind, and he passes on. The experiment, carried out the year before last, with a pack battery crossing the open as grazing cattle, clearly illustrates this point. The observer saw what he assumed to be cattle grazing in an open field ; a perfectly normal event within his experience. His suspicions not being aroused, he passed on. But the fact remains that it was a pack battery, and it was not hidden.

Curious mistakes have been made by observers. It is interesting to notice one or two, for they give an indication of the practical lines on which deception is possible. Thus during the Great War a large French cemetery was once definitely reported as a large enemy bivouac ; stretches

of a white road that had been tarred were reported as columns of troops. During the manoeuvres of 1925 the tents of a fair and hop pickers were reported as a military encampment. Here we get the reverse of what has been referred to previously. Things with no military significance whatever attracted the observer's attention because they aroused his suspicion under the particular circumstances. If such deception is possible without any expenditure of thought or money, there is surely a vast field for research by the application of thought and skill in this direction. It will be noticed that the experiment, and the mistakes quoted, lead us quite naturally to the fact that we must be prepared for two requirements:

- (a) What we want the observer to see;
- (b) What we want him to pass by unnoticed.

Both can be achieved by a variation of the same process.

Before it is possible to deal with constructive proposals for achieving deception it is necessary to take into consideration certain other factors which affect the problem. The first is *height*. It is essential to have a clear understanding of this important factor. It is obvious that deception by camouflage, and deception generally, can be carried out on far more impressionist lines when intended to deceive an observer flying at 10,000 feet, than in the deception of another flying at 3,000 feet. An examination, therefore, of the heights at which reconnaissance is normally carried out will present a useful basis on which to proceed.

"A military commander with aircraft at his disposal is responsible for watching the corresponding hostile formation opposed to him."—*F.S.R., Vol. II*. It follows from this that the army commander does not require the same detailed information as the divisional commander; nor does he get it. The long distance reconnaissance observer, obtaining information for the army commander, flies at a great altitude in order to secure immunity from attack. He cannot, therefore, be expected to *see* and report on details. In fact, he places most of his reliance in his camera. In any proposals affecting concealment in back areas therefore the deception of the camera is of primary importance. By merely *keeping still*, divisions on the march will escape the attention of an observer at 15,000 feet. From that height, however, a camera will reveal a battalion entraining at a railway centre, of which a photograph has been taken. From the normal height of an army reconnaissance to that of a close reconnaissance for the division, the drop is about 12,000 feet. It is, therefore, patent, that although the principle of deception forms the basis of all concealment, yet the requirements will vary according to the height of the observer. As the height is related to the military formation for which the observer is flying we can now separate our study into three main divisions:

- (a) Strategic camouflage (back areas); (b) Corps camouflage (medium distance); (c) Tactical camouflage (forward zone).

From the foregoing it is possible to suggest a practical solution to the problem. It lies in the formation of camouflage units based on the classification given above, thus :

- (a) *The army camouflage unit*, employing chiefly artificial camouflage and working out misleading suggestions on broad lines to be offered to the aeroplane ;
- (b) *The corps camouflage unit*, devoting itself to the study and the carrying out of simulated activity. Only on rare occasions would it be worth while to allow lesser formations to adopt this form of deception ;
- (c) *The divisional camouflage unit*, specialising in local deception combined with actual concealment (chiefly natural).

Small formations must fend for themselves, certainly in moving warfare. The most that can be aimed at in concealment, is to bring the fighting forces to their " jumping-off " places unobserved. After that they must stand revealed to the close reconnaissance observer, except where temporary local concealment is possible. Once concealment and deception are no longer possible, it is still contingent to *conceal strength* by dispersion and irregular formation.

The suggested solution would be comparatively simple were it not for two important factors :

- (a) The opposing Intelligence Corps ;
- (b) The failure of the scheme, if run by " routine orders."

The deception of the aeroplane observer by simulated activity may only mislead the latter in his reports, but not the corps commander who has an efficient Intelligence Service at his disposal. The introduction, therefore, of a Deception Corps, to be effective, must include increased vigilance to prevent leakage of information to the forward zone.

The essential qualification of a camoufleur is artistic and imaginative foresight. To include the thinking, designing and producing departments with the disciplinary, would be fatal to success. Two brains are needed at the head of such a corps. An intelligence mind to do the thinking and enunciate the military requirements. An artistic mind to do the designing and supervise the producing.

THE ARMED FORCES OF THE BALTIC STATES

(Compiled from reports in the Foreign Press).

THE creation, after the Great War, of an entirely new line of States along the shores of the Baltic Sea was partly the result of the application of the principle of self-determination and partly the answer of Western Europe to the rise of the Bolshevik Government in Russia. It was only natural that each of these States should promptly constitute an army wherewith to assert and to maintain its freshly-found independence.

Although it might be a comparatively simple matter to found these new countries on a general basis of existing nationalities, the constitution of their armed forces has had to contend with peculiar circumstances. Each of the new states had, previous to the Great War, formed an integral part of one or several of the Empires of Russia, Germany and Austria. So the subjects of the new states had seen service in one of these three armies. Each new country was then called upon to weld its newly-fledged forces into a separate entity. It was not surprising, therefore, that there should have come to light some differences of thought and of training, and in a lesser degree some discontent, that has been reflected in the morale of these new organisms. The extreme instance of this circumstance may be found in the case of Poland, where the new army is still chiefly officered by men who formerly were members of the Russian, German and Austrian armies and who had undergone a widely divergent upbringing and training. In addition, there have been encountered many difficulties in the way of finding the equipment necessary for an independent army. This has been particularly the case with heavy artillery, ammunition supplies, tanks and aircraft.

These differences and deficiencies will take some time to eradicate, if they are to be overcome at all in the near future.

Then, again, newly formed states have often shown a tendency to run to manifestations of intense nationalism and of national jealousy. There is, therefore, less prospect of their accommodating themselves to their neighbours' idiosyncracies, or of adopting any attitude compatible with that of federation whereby their armed forces might gain in power by means of a more united foreign policy and eventual military co-operation.

The new countries round the Baltic Sea are five in number. From north to south they are :—

Finland with a population of	3,500,000.
Esthonia	„ „ over 1,000,000.
Latvia	„ „ about 2,000,000.
Lithuania	„ „ about 2,000,000.
Poland	„ „ 27,000,000.

It will be seen, then, that, with the exception of Poland, none of these states are really of sufficient magnitude to maintain an army that is really commensurate to deal with a sustained, deliberate, attack coming from any more powerful neighbour. At the same time their lack of military strength is accentuated both by the open nature of their frontiers which offer few strategic advantages, and by their deficiencies in industrial resources suitable for the undertaking of a considerable campaign. Poland perhaps stands, industrially speaking, on a much higher plane, an advantage counteracted to some extent by a greater political weakness.

Again, it is not at all clear that internal complications might not impede the majority of these states from maintaining a campaign for any length of time. Internal jealousies and dissensions such as have recently come to light in Poland may have been the visible outcome of more deeply-seated causes of discord or of lack of national unity.

Lastly, there is the perpetual menace of Bolshevik or communistic propaganda and intrigue coming from Soviet Russia. Such a state of affairs can never conduce to a settlement of internal disagreements or to a complete and unshakeable harmony between these young states.

It must also be remembered that these Baltic states have been brought up in a school where violence and force of arms always loomed large. So there are always present innate possibilities of a *coup-de-main* or of some armed manifestation such as have been not unknown on the borders of Lithuania and Poland. Moreover, many of these peoples possess martial qualities, so that adventures which would be regarded as brigandage or forays on the grand scale, might not be considered in the same light as in more peaceful regions. Lastly, what of the potential future attitude of the erstwhile masters of these young countries?

Another feature of some importance in the present political situation of these states is the efforts that are being made by Russia on the one hand and Germany on the other to obtain a favourable, and probably dominating, influence in their political and commercial orientation. Germany has succeeded in concluding treaties for the promotion of commerce and friendly relations with Esthonia in 1925, with Latvia in 1926 and with Lithuania in 1923. Russia has not been so successful. Poland, however, has not been drawn into any similar engagement. The Customs Tariff war between Germany and Poland still continues,

while Polish opinion remains averse to entering into a pact of non-aggression with the Soviets.

There is in Eastern Europe material for an armed conflagration that might be set alight as easily as in the Balkans.

It is, consequently, not without interest to examine very briefly the armed resources of these various states. Such an analysis will better illustrate some of the potential sources of trouble that exist in these parts. This end is best attained by a summary exposition of the armies in question.

FINLAND.—The peace strength of the Finnish forces may be roughly set down at 1,600 officers and 26,000 other ranks; 112 pieces of field artillery; 24 heavy guns; 1,200 machine guns; 30 tanks; 70 aircraft.

On mobilization for war it is estimated that 90,000 men could take the field. But, in proportion to the population, this total should be capable of increase to 200,000 men. The difficulty is, of course, that at present only the yearly classes of 1919 to 1925 can be really depended upon as trained men. The remainder would be formed out of men who had received all their military education in the old Russian army, some of whom might prove of doubtful advantage.

The military value of the Army is further rendered very difficult to estimate owing to two facts:—

- (i) The political sympathies of the recruit;
- (ii) The lack of unity among the officers.

(i) The existence of a considerable communistic tendency in Finland is shown by the fact that, when the annual contingent of recruits is called up, every man is (on paper) given a number by the recruiting authorities thus:—

- "1," if he be politically "sound";
- "2," if he be "uncertain";
- "3," if he is a communist.

Men bearing the number 3 would not be admitted to a machine gun company nor to a position of trust.

(ii) The cleavage among the officers arises from the opposing sympathies of the so-called Swedish and Finnish elements. The latter have for a long time past striven to eliminate a number of their rivals from higher posts on the grounds that they held far too large a proportion of these appointments. The cause for the last-named circumstance arises out of the fact that a great number of the "Swedish" officers have acquired military experience under Russian and German masters, whereas the true Finn only began to rise in the military career during the late War of Independence. Hitherto the Finnish Government has regarded merit only in questions of promotion. Should the Swedish element be ousted, the result must affect the value of the Finnish army. So far the cleavage has been most marked in social matters, since the "Swedes" come undoubtedly from the better social classes.

Again, among the true Finns there exists another distinction. A number of them, out of patriotic motives, left Finland during the Great War and served in the German 27th Jäger Battalion. They returned to Finland for the War of Independence and secured many good appointments. Another section of the Finnish element, however, trained in the Imperial Russian Army, possesses a better military education and has, consequently, substantial claims to advancement which they consider they have not obtained. The struggle between these two groups is acute and carried on publicly. So the "Jäger" section in 1925 succeeded in forcing the Commander-in-Chief, General Wilkama, to resign. That officer was then reinstated, only to be once more deposed in 1926 when the "Jäger" party found itself strong enough to effect this coup.

The rank and file of the Finnish troops is not divided in the same fashion. But the growth of communistic sentiments does certainly constitute a menace to the army. This is a pity, for the Finns possess undoubted military qualities.

The Social-Democratic party is bent on a reduction of military service and might in time achieve its object.

Finland also maintains some form of coast defences and aspires to form a navy, but money is deficient for the formation of much beyond an army of six divisions on mobilization.

In addition to the Army, there exists in Finland a Defence Force organized on a strictly military basis and maintained as a parallel organization to the Regular Forces. It differs in this respect from the British Territorial Army, as well as in the fact that, on mobilization, it would be incorporated into the Army in the guise of reserve formations. In time of peace it may be and is even employed on frontier duties to the relief of the regular units.

This Force comprises all annual contingents, not liable to regular service, from fifteen to sixty years of age. It numbers close on seventy battalions, a dozen batteries and a few special troops including a motor boat squadron. It is largely trained by regular officers on Sundays and holidays. Service is voluntary and recruits of known political sympathies are alone accepted. The Defence Force possesses true military value.

ESTHONIA.—The armed forces of this country number some 22,000 of all ranks, a total that includes a Frontier Guard of 2,000 men. These troops possess over 1,000 machine guns of various types, 36 field guns, 32 heavy guns, 16 tanks and 60 aircraft.

On mobilization it is claimed that this Force could be expanded to three complete divisions with a total strength of about 60,000 men. In addition there would be some further 30,000 men available as reinforcements.

In spite of its small numbers the Esthonian Army possesses real value. National feeling is strong and communism has not undermined the morale of the troops. This was made clear by the failure of the attempted Communist rising at the close of 1924. The Government also has hitherto pursued a strongly anti-communist policy. In 1926 the Communist Party was forcibly dissolved.

The officers are mostly drawn from former Imperial Russian personnel and appear to be animated by a wholesome desire for national unity and military progress.

Esthonia, some two years ago, set about the creation of a Defence Force wholly after the Finnish model. This is armed, trained and equipped by the War Ministry and appears to be a satisfactory organization. It now numbers something short of 20,000 of all ranks.

LATVIA.—The Lettish Army on a peace footing numbers about 1,800 officers, 18,000 other ranks, some 800 machine guns, 100 guns (mostly field artillery), 30 aircraft, 25 tanks. In addition, there exist^s a Frontier Guard Corps and some coast defence units manning the forts.

On mobilization provision has been made for the formation of four divisions, one technical division and a small force of cavalry. Including the men trained in the former Russian Imperial Army this would mean an army of somewhere between 125,000 and 145,000 men.

The officers are recruited entirely from the intellectual classes; all but the junior ranks have been trained and have served in the former Russian Army. They form a homogeneous and seemingly well-trained class. German opinion would place them on a much higher level than the officers of the neighbouring armies. It is stated that communism has not made any progress among the rank and file; in fact possibly the reverse. The feeling of nationality is also said to run high among the Lettish soldiers. On the other hand, politics have lately been by no means as tranquil as might be desired; this factor might not conduce to a perfectly satisfactory development of the Lettish forces—or of their necessary equipment in material which they still lack.

It has recently been stated that the soldierly spirit of the latest batches of recruits leaves something to be desired; also that the physical fitness of the younger classes is showing signs of falling away.

LITHUANIA.—The peace strength of the Lithuanian forces amounts to some 1,200 officers, 20,000 other ranks, 52 field guns, 12 heavy guns, about 1,000 machine guns, 44 aircraft and 32 tanks.

On mobilization a trained and organized force of some 80,000 men could take the field organized, it is believed, as three divisions with additional troops. The actual number of trained men is now 100,000; to which total should be added an equal number of men who have passed through the former Russian Imperial Army. There is not, however, any equipment or armament in existence for a total much above the

war establishment stated above ; in particular the shortage of artillery is serious.

There also exists in the country a system of so-called " Rifle Associations " which are organized on the Finnish model. In conjunction with this organization the military training of schoolboys is also being introduced. The Associations do not show more than 12,000 members.

Various reports from travellers in Lithuania would make it appear that the discipline of the Lithuanian Army is indifferent. This arises from the fact that communism has made considerable progress in the country.

POLAND.—In treating of the armed forces of a country of some importance—numerically and politically—it is difficult to do so satisfactorily in a brief compass. This is especially the case with the Polish Army, for it is still in a process of organization, while there exist further plans for the formation of some additional cavalry regiments, a large increase of heavy and A.A. artillery, tanks and aircraft. The army in fact, must be regarded as yet incomplete, if the full scheme of expansion is to be carried out.

The reorganization of the Polish forces was initiated in 1920. The peace establishment is not far short of 300,000 of all ranks out of whom over 18,000 are officers. There exist, in addition, some Frontier Guard units.

On mobilization, the embodiment of the men trained since 1920 should yield a strength of close on 1,000,000. There are also all those men trained in the former German, Russian and Austrian armies who may be taken as amounting to another 1,000,000.

The scheme of mobilization is said to provide for the creation of ten army corps of three divisions each with four or five cavalry divisions, together with independent cavalry brigades and other specialist units. This total, if reinforced with the number of reserve formations that might be constituted out of available resources, might approach sixty divisions with special troops ; that would mean a grand total of 2,000,000 of all ranks and arms.

But there are many difficulties in the way of the eventual realization of so ambitious a plan, quite apart from the somewhat disturbed state of higher politics in Poland. Also there is the question of finance.

It can be assumed that the Polish Army has a long way to travel before being capable of acting as a homogeneous, unified and efficient force of sixty divisions.

To begin with, the annual increase of population in Poland is very high ; it amounts to little short of 1,000,000 per annum. It is doubtful whether anything like even half the annual contingent of conscripts is being trained at all ; in fact a German estimate places that annual contingent at 400,000 recruits, of whom only 170,000 are actually selected

for training ; this training, moreover, is carried out by batches and only according to the funds available.

In addition, there is reason to believe that the relations of officers and civilians leave somewhat to be desired. Not long ago, for instance, the entire Taxi-cab Drivers' Union of Warsaw boycotted the whole of the Aerial Officers Corps as the result of a brawl between a driver and two of these officers in which the former was shot by his fares. Again, a considerable scandal was recently caused by a tram-conductor having his ear cut off by a sword-cut administered by an officer who felt injured by the conductor's refusal to stop for him.

In the case of the troops there is a distinct cause of weakness to be found in the high percentage of nationalities other than pure Polish represented in the Army. True Poles amount to under two-thirds of the whole forces : the remainder are Russians, Germans, Lithuanians and others. The Germans especially cannot be regarded as loyal Polish subjects ; while the Russians and Ukrainians are said to be particularly averse to Polish discipline. It had formerly been the rule to group these men into special units, but the practice has been abandoned in favour of that of distributing them at a distance from their homes among Polish units. It is said that this system is yielding better results. Desertion, however, is not infrequent ; insubordination has been known to occur.

Much technical progress, outside the three main combatant arms, has yet to be realised. Thus, many air crashes of an avoidable nature have led the Polish press to speculate, with apparent good reason, as to how far the Polish Air Force was properly equipped and trained. It became a standing joke to designate the military aircraft as "flying coffins." That, however, is a slight exaggeration of the facts, which are serious enough.

But the main obstacles to the formation of a truly homogeneous army are largely of a political nature. The officers, in particular, are divided into parties dependent on their former service. To those who served in the German, Russian and Austrian armies must be added a further contingent derived from the Polish Legion that fought with the Allies in the Great War, and, lastly, those who, later, served in General Haller's forces. The ex-officers of the "Legion," who are headed by Marshal Pilsudski, have decidedly socialistic leanings and side with the Left in Polish politics. They had received a severe set-back at the hands of the "nationalist" elements until restored to power by Pilsudski's recent *coup* in May, 1926.

That whole affair was not far from ending in civil war. As it was, there took place some two days' street fighting in Warsaw during which 500 men were killed and 1,800 wounded. Pilsudski's victory was complete.

Setting apart the weaknesses that have been outlined above, the Polish Army has in many respects made much progress during the past five years. Individual units show promise of becoming truly efficient, while, as far as can be judged, the lower command is quite satisfactory. On the other hand, the facility with which the troops took sides against each other during the Pilsudski *coup d'état* seems somewhat strange. National homogeneity has not yet been attained.

The future of the Polish Army is at present largely dependent on Pilsudski's own personality. He is now War Minister and Inspector-General of the Army and thus exercises an autocratic influence which in reality extends far beyond the Polish armed forces.

On assuming office, Pilsudski began by reducing the number of Inspectorates in Poland, thereby cleverly shelving his own personal opponents. This step was followed by a drastic "purge" throughout the Army of all officers openly hostile to the dictator. Similarly the military spirit of the whole country is to be raised to a higher level, whilst being freed of political bias. Nevertheless, this is in process of being effected by strong official support from local Rifle Associations hitherto associated with the Left, that is, Pilsudski's own political party. Pay is to be increased. The success of all these measures must be dependent to a large extent on the extent to which economic progress may be seen to follow on the dictator's *coup d'état*. Should Polish commerce make any visible progress, the Army must gain greatly thereby.

Poland, however, is ambitious and is also desirous of figuring on the sea. It has recently been decided to purchase the obsolete French cruiser "Dessaix," and to employ her as a training-ship for the creation of a maritime coast-defence force. Whether it would not be wiser to concentrate the resources of the country on the formation of a smaller and more thoroughly trained land and air force has yet to be proved.

SHANGHAI AND THE FUTURE OF CHINA

BY A SHANGHAI TRADER

THE time cannot be far distant when the Chinese Nationalists will formally challenge the status of the international settlement at Shanghai, the great city which is at once the main gateway into China and the vital centre of her foreign trade. In this city will arise in their most difficult and controversial form all those problems, the solution of which may determine the whole future development of China and the nature of her ultimate relations with western civilization as represented by the Treaty Powers.

Shanghai, like Bombay or Calcutta, has been built up from small and insignificant origins largely by the energy and enterprise, the science and the machinery, of the western civilization of the foreign settlers and merchants until it has become the *de facto* capital of the Chinese Empire.

In China, as in India, the most urgent of the new political and social problems are the product of the spirit of nationalism and the clash of its new claims for self-determination with institutions which had grown up under the widely different conditions of an older environment, now in process of rapid change and evolution. The last decade which opened with Mrs. Besant's Home Rule Agitation and the famous Parliamentary declaration of the policy of "gradual development of self-governing institutions with a view to the progressive realization of responsible government in India" has added enormously to our knowledge and appreciation of Indian problems. Of China the average educated Englishman has still nearly everything to learn, but it seems probable that another decade of enlightenment and understanding has been inaugurated by the British memorandum of December, 1926, which, like the declaration of 1917 contains express recognition of the essential justice and inevitableness of the Chinese aspirations and claims.

Our Indian experience and knowledge, if applied in the Far East, will greatly assist us in understanding some aspects of the Chinese situation and perhaps in forecasting the course of its future development. It is interesting to compare the constitution and government of the city of Shanghai with those of the cities of Bombay or Calcutta and to reflect upon the contrasts between the relative positions in the two countries of the indigenous and the foreign elements of the population. The contrasts seem all the more glaring when it is remembered that in Shanghai the Europeans and Japanese are foreigners, while in the Indian cities the position of the Englishman is that of a citizen in his own British Empire. The main outlines can be brought out very clearly

by a few salient facts and no detailed comparison is necessary. The Shanghai international settlement has a population of 30,000 foreigners and 1,000,000 Chinese inhabitants. It is governed by a small body of nine foreigners elected by the foreign ratepayers. Out of the nine, six are British, two are American and one Japanese—these ratios having been fixed by a sort of friendly understanding among the various communities.

A Japanese request for a second representative is now under discussion. The Chairman is now an American. This body, so constituted, administers an annual revenue equal to that of some of the smaller Provinces of China. Eighty per cent. of this revenue is contributed by Chinese ratepayers but they have no voice in the government of the city nor in the election of the governing body. Turning now to Bombay we see another great modern city, the "gateway of India," which is not only a great manufacturing centre but also a vast emporium of world trade and commerce. Its population and the European and indigenous proportions of the population are practically identical with the corresponding figures of Shanghai. The affairs of the Corporation are managed under a statutory constitution by a body of 106 Councillors, including only three officials, out of whom sixteen are nominated and ninety elected on a wide franchise. The Indian Councillors number ninety-one the Europeans only fifteen.

The Chairman is an Indian elected by the Corporation and there is an informal arrangement among the leading communities that the office should be held in rotation by a Hindu and Mahomedan and a Parsi or Jew. Among the most successful of recent Presidents was Mr. Vithaldas Patel who at the time of his election was one of the most prominent and active of the Swaraj party leaders but has now become politically neutral since his elevation to the Presidential Chair in the Imperial Legislative Assembly. The Corporation wields extensive powers and raises and spends an annual revenue of three crores of rupees, say two million pound sterling.

The Shanghai constitution has come down unchanged from a time when it seemed, even to the Chinese themselves, to be the natural and appropriate machinery for providing what the Chinese Government could not then provide, reasonable security for life and property and the ordinary amenities of civilized urban life. But the institutions which were appropriate half a century ago and which have in fact immensely increased the wealth and prosperity of the country are, nevertheless, now felt by all parties to be a grievous misfit under modern conditions. No parallel can fairly be drawn between the political and constitutional antecedents of Bombay and Shanghai, but politicians have short memories and very little sense of history and what strikes the eye now is that Shanghai to-day is being still governed under a constitution which would have been impossible for the Bombay of 1890. Reforms have been shelved and delayed so long that they have now

to contend, not only against the strongly entrenched forces of reaction and conservatism, but against the passion and prejudice and suspicions of offended national sentiment. A decision was, however, taken at last and the Chinese authorities were invited by the governing body to associate three Chinese with the foreign members of the Municipal Council. The offer was then accepted as satisfactory but subsequently a local agitation was raised for equality of representation with nine Chinese members. In an international settlement it is the least progressive members who set the pace and it is likely that before unanimity can be reached the Nationalists may formulate further demands for much more drastic and sweeping changes. All these foreign difficulties are complicated by the fact that the Peking Government has been overthrown by revolution and civil wars and has left no successor whose title can be recognized even as *de facto* ruler of the whole country.

"Nave senza nocchier in gran tempesta,"¹ Dante's famous phrase for mediæval Italy, rent and convulsed by factions and civil war, would equally describe the China of to-day where the same destructive and disruptive forces are at work on a far vaster scale with the added strength of rifles and machine guns, bombs and aeroplanes. An observer from India might also remember that other Italian poet who spoke of the pleasure of watching from the land the sore travail of men who are battling with tempestuous seas. For India may congratulate herself on having escaped, though perhaps by a narrow margin, dangers which result from too long delays in the introduction of reforms which are necessary for the healthy development of national life. It is in these delays that we may find one of the root causes of the dangerous anarchy which now threatens to involve in common ruin the interests of the Treaty Powers as well as those of the Chinese. If responsibility has to be fixed it would be difficult to decide whether Chinese or foreigners are more to blame for the lack of vision and statesmanship, the narrow conservatism and prejudice, and the neglect of opportunities, which have led up to the catastrophe.

Until the middle of the nineteenth century China had lived in nearly complete seclusion from the outside world, not in blind prejudice, but because of her experience through many centuries of her immediate neighbours, savage and barbarous tribes with whom contact and relations were distasteful and unprofitable. It was at the doors of this ancient, solitary Empire that the western nations in the middle of the past century began to knock for admission in their quest for markets and raw materials. The economic development of the West brought China face to face with the necessity of rapidly improvising in her national life and culture all the intricate and complicated adjustments necessary for political and commercial intercourse with the highly organized nations of the West. The task would have been difficult even for

¹ "Ship with no pilot in a raging storm."

a country whose past history had endowed her with ample stores of political experience. The Chinese governors and officials who negotiated the series of commercial treaties which began in 1842 were totally without experience of foreign relations and diplomacy. Self-centred and isolated for centuries they had no conception of the meaning and value of sovereign independence in relation to foreign powers, and they could not realize that their independence was being undermined and endangered by alienations of rights and privileges, each one of which formed a precedent for further encroachments and concessions. At the same time it was the special misfortune of China that her economic and political crisis came upon her at a time when her ruling Manchu dynasty, which in the eighteenth century had been efficient and vigorous, was declining into a condition of effete and impotent corruption comparable to that of the later Moghul Empire in India. The time which called for "a daring pilot in extremity" found the helm of the State slipping out of weak and nerveless hands. The Chinese people were an amorphous agglomeration of loosely coherent largely autonomous peasant communities with no horizons beyond their own local needs and interests. National consciousness hardly existed and in the social organization there were no natural leaders to set an example of public spirit and service and self-sacrifice. From such a society there could be no early hope of leadership and initiative in thought or action to fill the place vacated by the breakdown of the central government.

History presents few contrasts so striking as that of the different reactions of China and Japan in the face of identical problems. Her widely different historical development and her feudal organization under an enlightened aristocracy made it easy for Japan to reach solutions which in China may still have to wait for more than one generation of discipline and education. On the other hand it must be remembered that in the course of her long history China has never failed to recover stability after recurring phases of disorder and anarchy. A society whose memories and traditions stretch back over forty centuries may perhaps need a different time scale from that of the West in readjusting herself to new conditions, and when the task is complete the structure though built slowly, may perhaps for that very reason be all the more solid and enduring.

The historian of the last quarter of the nineteenth century does not dwell with pride or satisfaction on the relations of the great Powers with their wealthier neighbours in Asia and Africa. It was the era of economic imperialism which at times became openly aggressive and predatory. In China it produced by imperceptible degrees a situation which recalls the renaissance of Prussia and Germany in their struggles to shake off the yoke of Napoleon's domination. The spirit of Chinese nationalism awoke and the Reforms Movement began with its furious anti-foreign campaigns and its bitter denunciations of "unequal treaties" and of all foreign rights and privileges injurious to Chinese dignity and independence.

The best hope for the future lies in the changes of national ideals and policy which are being brought about in Europe by experience gained during the World War of the bitter fruits of militarism and imperialism. In an era of international co-operation with recognition of equal rights of self-determination for all adult nations, whatever their size and power there is no need to despair of peaceful settlement even of problems so complex and difficult as those now at issue between China and the Treaty Powers. The recent settlement of the long standing differences between South Africa and India is a good example of what can be achieved with patience and goodwill and a sincere effort on both sides for mutual understanding.

The British memorandum of last December, and the specific offer made a month later to implement in practical detail by actual waiver and alteration of Treaty rights, the principles set forth in the memorandum have given a lead which can hardly be ignored either by the Chinese or by the other Treaty Powers. It offers the immediate introduction of important reforms which involve the recognition of the advances which China has made in modernising its legislation, its courts, and its municipal administration. It restores in a great measure the fiscal and financial autonomy of China and not the least of its merits is that it does not postpone these advantages to some problematical future date when a single central government shall have emerged capable of formal negotiations for treaty revision, it offers them immediately to any *de facto* government, even of limited and local authority, which is sufficiently organized to accept them. The Hankow settlement, rough and ready as it was, affords ground for hoping that Shanghai will not prove to be a Gordian knot incapable of solution except by the sword.

THE INTERNATIONAL SITUATION

RECENT EVENTS IN CHINA

SINCE the seizure of the Concession at Hankow early last January, the civil war in China has assumed a more threatening aspect, while its scope has widened. After having been long conducted by a number of self-appointed generals, it has now grown more popular and nationalist in spirit. Formerly the war seemed to have rested largely on hopes of personal aggrandizement or gain; now it shows a far more definitely anti-foreign complexion. Nevertheless, the nature of the fighting has not altered. Apart from the wider front and the extent of ground which they have covered, the operations do not appear to have gained in intrinsic military importance; nevertheless, the chaos into which China has now fallen appears more serious and less likely of any immediate settlement than at any time in the past.

At the present moment civil war seems to be running its course concurrently with manifestations of three other phenomena. The first is the violent campaign of anti-foreign propaganda, already named; the second is a native labour movement which, for some years past, has been noticeably growing, but has hitherto kept within reasonable bounds; the third is the exploitation of unrest in China by the Soviet Government of Moscow. When, as has recently been the case, the conduct of civil war is combined with violent outbursts of all these subsidiary causes of disorder, that form of war can only grow more universal, more destructive in its effects and still more uncertain in its ultimate consequences. Moreover, the crass ignorance of the Chinese multitudes permits of these outbreaks being more easily aroused and more dangerous in their orientation against Western Europeans.

It is, consequently, not surprising that the past quarter should have been barren of any true military operations, whilst being filled with a growing list of political negotiations—that lead to nowhere—in addition to grave civil disorders.

The outstanding military event of the period is the north-easterly advance of the Southern (Cantonese or Nationalist) Armies into the Province of Kiangsu and their seizure of the cities of Nanking and Shanghai. There appears to have been a sound strategic undercurrent in the conception of the operation, although its execution was devoid of all merit. It was clear that the situation of Nanking is such, that any army moving from the front Hangchow-Hankow would immensely weaken the hold of the Northerners on Shanghai by any preliminary

occupation of Nanking. Only the command of the sea and the possession of adequate naval transport could then have saved Shanghai. Far from possessing such power, the Northerners could not even rely on the loyalty of their troops, let alone on their generals.

The Southerners, during the middle of March, moved in three columns on Nanking; the main right-hand body marched West of Lake Taihu, the centre advanced along the Yangtze, while a left column from Kinkiang headed for the Pukow railway to the North of the river. Simultaneously another Southern Army made for Shanghai. By the 18th March the latter had turned the left of some rather weak and perhaps unreliable Northern divisions at Sunkiang. By the 21st of that month the city had passed into Southern hands. Of actual operations there was little worthy of the name. Chang Tso-lin, the Mukden War Lord, had been reported to be making efforts to save Shanghai and to be sending his best troops southwards; but the defence of the city devolved upon Chang Chung-cheng, the Shantung generalissimo, and his subordinate, Pe Hsu-cheng. The latter proved worthless and went over to the Cantonese.

Shanghai thereupon became the scene of grave disorder. Retreating Northerners, advancing Southerners, local ruffians, Communists, labour firebrands, all seem to have indulged in, or promoted violence, looting and arson. Indiscriminate shooting, together with a general strike to commemorate the Southern "victory," completed the confusion. British troops guarding the perimeter of the International Settlement became involved therein, when some hundred Chinese soldiers attempted to cross the Settlement. The Chinamen were disarmed, after a little firing by the Durham Light Infantry. The crew of a British armoured car had previously been fired upon and hit.

On 24th March the Southerners entered Nanking. The fighting would seem to have been even more inconsequent, while mob violence was greater. Anti-foreign feeling, in the absence of any European protecting force, ran very high. Murder, arson and looting took place. The British Consulate was attacked, and then looted, the Consul being wounded. The Japanese Consulate was similarly treated. The University was also the scene of much disorder. The American Consulate was so far threatened that its inmates and other foreigners took refuge in Socony House, situated on Standard Oil Hill. There their position grew so serious that H.M.S. "Emerald" and U.S. Ss. "Preston" and "Noa" put down a barrage from their guns, whilst landing parties brought off the entire European refugees from the Hill.

Confident of further success, the Southern commanders seemed to turn their thoughts once more towards Peking. By the beginning of April the Cantonese troops were across the Yangtze, at Wuhu and at Chinkiang. They began marching along the Pukow railway towards Tsinanfu. The movement, however, does not seem to have carried them far. By the 6th April the advance had reached Kwanten, near

Pengpu. Fighting has certainly taken place in that neighbourhood, but of what nature there is little evidence to show. On 8th April the Southern forces were alleged to have moved northwards in three columns and to have reached Kooyu, thirty-five miles from Chinkiang, Mingkwang and Fenyang, a week's march from Pukow. It is, however, not improbable by this time that the Southerners have been checked or that political events may be holding up any further military operations of real importance.

So much for the military state of affairs. The course of political events has been more diversified and more complicated.

Apart from the normal venality of the protagonists in the civil war, which has often caused the operations to assume the nature of a lottery, actual politics have now begun to shape the attitude of the Chinese commanders-in-chief. Among the Southerners there has been a split. The Cantonese Generalissimo, after prolonged wavering, has thrown in his lot against the Communist faction of the Cantonese authorities. So now there exist two so-called governments to the South of the Yangtze; there is the "Red," pro-Russian, Communist administration, which has been set up in Hankow, while Chiang Kai-shek, former Cantonese Commander-in-Chief, has placed himself at the head of a more moderate and anti-Communist section of the Kuomintang, or Nationalist Party, at Nanking. This has resulted in the declaration of hostilities between the Cantonese forces dependent on Hankow and on Nanking. Another factor in the situation is that Feng Yu-hsiang, the notorious "Christian General" and ally of Moscow, has now been appointed generalissimo of the Hankow party. Whether Feng will bring his followers South is not yet known. At present it is rumoured that both at Hankow and at Nanking there are some 200,000 men, respectively, available for operations. But the situation abounds in uncertainties.

Meanwhile at Peking, Chang Tso-lin, with the sanction of the diplomatic body, raided the Soviet legation, and, from the documents thus coming into his possession it is said that the Bolshevik complicity in all the recent Chinese disorders has been amply proved. At all events, relations between Moscow and China, both Northern and Southern, are believed to be much strained.

In conclusion, it is of interest to reproduce the identical offer made to the Northern and Southern Chinese authorities at Peking and Hankow respectively by H.M. Government on 28th January last:

"(a) *Extraterritoriality*.—H.M.'s Government are prepared to recognize the modern courts as the proper courts for cases brought by British plaintiffs or complainants without the attendance of a British assessor.

(b) *Concessions*.—With regard to British concessions (of which there are six) H.M.'s Government are prepared to enter into local arrangements—in each case—either for the amalgamation of the Municipal Council with the administration of adjacent ex-concessions (*e.g.*, German and

Russian) under Chinese control, or for the amalgamation of the police forces of such areas, or for the relinquishment of police control and responsibility for maintaining order, which tasks would then fall upon the local Chinese authorities.

(c) H.M.'s. Government will recognize the validity of a reasonable Chinese nationality law.

H.M.'s. Government will apply in British courts in China the modern civil and commercial codes of China, and will agree to subordinate legislation, thereby placing British subjects on an equal footing with the Chinese in all matters relating to tariff, taxation and obligation to conform to regulations, whether local or general, such as those relating to navigation of inland waters.

H.M.'s. Government are prepared to give an assurance that British ships of war will in future restrict their movements to waterways giving access to treaty ports and will only proceed into other waters when engaged in the chase of pirates.

British missionaries will no longer claim the right to purchase land in the interior.

H.M.'s. Government will agree to any reasonable arrangement in regard to customs revenues, such as progressive relinquishment of control over present customs revenues, as and when secured obligations are extinguished."

So far there has been little likelihood of these terms being discussed to any effective purpose.

THE LIMITATION OF ARMAMENTS

THE Preparatory Commission for the Disarmament Conference have been in full session during the past quarter and have had before them the report of the Naval, Military and Air Sub-Committee, referred to in the last JOURNAL. Their efforts have been directed to formulating a draft convention on disarmament to be submitted to a full International Conference which it was hoped to assemble at Geneva later this year.

As recorded in these Notes, very divergent views and interests have manifested themselves in the preliminary discussions and these have presented such difficulties that the Commission has found it necessary to disperse until November without being able to formulate any convention. The delegates are returning home with the object of laying before their respective Governments a full statement of the deliberations at Geneva; it is anticipated that they will return in due course with fresh instructions as to what is to be their future attitude in regard to the more highly contentious points.

In spite of this apparent failure, it is claimed for the Commission that certain results have been achieved and some measure of agreement reached in the sphere of limitation of land and air armaments; it is hoped that these will form the groundwork for a limited convention agreeable to the majority of the States represented on the League of Nations. On the other hand little progress has been made in finding a basis of agreement on naval armaments. Before the next meeting, however, the Naval Conference between the three principal Sea Powers may have helped to further matters in this direction.

All the problems approached by the Commission appeared so novel as to necessitate lengthy discussion in order to find universal comprehension, let alone any agreement. Thus, for instance, in discussing "total" military effectives, there arose a sharp division of opinion as to what "home" and "colonial" establishments imply. Great Britain maintains a "total" establishment of some 150,000 men dispersed all over the world in addition to independent Dominion and Indian establishments that are not even controlled by the Home Government. Other European countries maintain distinct armies, financed on separate estimates, for "home" and "colonial" purposes. Lastly, some Powers are so closely situated to their Colonial possessions as to render the two classes of forces indistinguishable in strategic value. Again, there are many difficulties in the way of segregating and clearly defining military and civil aviation. In view of these divergencies it is not surprising that the points of agreement have not been very many.

In endeavouring to find some basis on which to formulate a draft convention, the Commission spent much time considering two model conventions, one submitted by Lord Cecil representing Great Britain, the other put forward by M. Paul Boncour on behalf of the French Government. Apart from the inherent difference of mentality and outlook of Great Britain and France, which was revealed in the discussions, there was also found to exist a divergence of views in the manner in which the problem was faced by these two authorities. Lord Cecil urged a limitation of armaments in order to obtain "a prevention of aggression, a prevention of competition, a promotion of the feeling of security." He was prepared to be satisfied with the universal acceptance of a few basic principles which could only be amplified and augmented with the lapse of years.

THE BRITISH DRAFT CONVENTION.—The British draft convention was thus of a fairly general nature consisting of five chapters. The first being a preamble; the second dealing mainly with the limitation of effectives of the land forces that could be put into line on mobilization; the third would have limited the tonnage of naval armaments *by categories* of ships; the fourth aimed at restriction of the total number of aircraft; the fifth and last defined the validity of and mode of terminating the convention.

THE FRENCH DRAFT.—The Draft Convention drawn up by the French was far longer and more searching ; it consisted of seven chapters, subdivided into twenty-nine consecutive articles and ending with a series of detailed tables. The real gist of the French contentions, as shown both in the draft and in the subsequent discussions, is as follows :—

- (1) Land, sea and air armaments are interdependent ; they should be limited on a grand total.
- (2) Strong opposition to a limitation of naval tonnage *by categories* ; France would accept a limitation of *total* tonnage, but insisted on the right to construct warships within that limit as she chooses.
- (3) The present composition and training of reserve forces is not to be interfered with ; Powers remain free to do as they choose within those limits.
- (4) In limiting armaments the " war potentialities " of each State should be taken into account, that is to say, superiority of strategic position, industrial reserves, financial resources and so forth.
- (5) Civil and military aviation are to be considered as wholly interdependent.
- (6) Budgetary expenditure for military purposes should be taken as a basis of comparison for limiting armaments.¹
- (7) France would be ready to accept supervision of armaments provided it came from a duly constituted body of international standing such as the League of Nations.

Certain concessions were made by several States, notably by Great Britain, and in the end a compromise was arrived at on a number of points. Amongst others the limitation of aerial armaments, both as to total numbers of aircraft and their total horse-power, was accepted in principle. The chief stumbling block remained the unwillingness of all parties to compromise on the matter of naval tonnage—whether this should be *total* or *by categories*. Lord Cecil, putting the case on behalf of Great Britain, said : " We have made a great many concessions ; we have received very few in return."

Another difficulty of a totally different nature was the anxiety of the Eastern European States, Finland, Esthonia, Latvia, Poland and Rumania, as to what might befall them, if they should be attacked by Soviet Russia. This very grave question remains to be answered, unless, in the meantime, the unexpected should happen and Russia should consent to become a party to the next sittings of the Preparatory Commission with a view to accepting some measure of disarmament

¹ This, it may be noted, would penalize the Powers maintaining expensive professional establishments and favour the cheaper conscript armies.

for herself. In view of what the Soviet Government is saying and doing at the present time, this seems scarcely likely.²

The net result, therefore, of the sittings of the Commission up to date is not very great. The idea of "security" is still very firmly rooted in men's minds. Nevertheless, the general principle of a limitation of *striking* forces with a view to preventing surprise mobilization and attack has been accepted. The Commission was unanimous in desiring more publicity concerning, and more detailed publication of, all details affecting armaments. As the German delegate put it bluntly: "With secrecy disarmament is impossible."

² See "The Foreign Policy of the Soviet Government" in these Notes

THE NAVAL CONFERENCE

AS foreshadowed in the last JOURNAL, President Coolidge has addressed a memorandum to the principal naval Powers inviting them to participate in a further naval disarmament conference. The President emphasizes the view that no general agreement on disarmament can be expected in the immediate future, but that, in his opinion, the moment is opportune for the consideration of naval strengths. While admitting that naval defence cannot be entirely dissociated from the needs of military and air forces, he maintains that the two latter tend to solution by regional agreements and are not primarily a concern of the United States. On the other hand, the problem of the limitation of naval armaments is not regional in character and can be dealt with in a practical manner by measures affecting the navies of a limited group of Powers.

This message was dispatched early in February, and Great Britain and Japan have since agreed to enter into a three-Power conference to be held at Geneva as soon as possible after 1st June of this year. Neither of these two Powers has referred to the extension of the 5 : 5 : 3 ratio mentioned in the Coolidge memorandum.

France has declined to participate in the conference on the ground that such questions are more properly the concern of the League of Nations. Subsequently, she has signified a desire to reserve her reply to an invitation to send an observer to this conference.

Italy has also declined to take part, pointing out that her geographical position in the Mediterranean prevents her adoption of any system that limits the defence of one State while allowing full liberty to other States. Unlike the United States, she cannot consider

the question apart from other armaments generally; the statement in the memorandum that the problem is not regional in character is, in fact, inapplicable to her particular case. Italy, however, is sending an observer to the conference.

Speaking before the Preparatory Commission for the Disarmament Conference on 11th April, Lord Cecil said that in his view the Coolidge Conference did not in any way compete with the work of that Commission.

THE FOREIGN POLICY OF SOVIET RUSSIA IN 1926

(Compiled from Foreign Sources.)

THE main feature of Russian foreign policy during 1926 has been the strenuous effort made by the Soviet Government to conclude agreements with neighbouring States whereby the former hope to neutralize the British tendency to isolate the Soviets from the civilized world. The first steps taken in this direction in the past were the agreements concluded with Germany and Turkey. To these must now be added the Neutrality Pact concluded with Afghanistan on 31st August. The clauses of this instrument are such that they are held in Russia to have terminated the struggle for a predominant influence in Afghanistan in favour of Moscow as against London.

On the Baltic shores, however, the Soviets have not encountered equal success. Pacts have not materialized as had been hoped in Moscow. There is reason to doubt whether Russian efforts in this direction are so absolutely disinterested as to desire a complete maintenance of the political existence of these States. Nevertheless, Russian efforts at asserting her influence in these parts have to be treated seriously enough. As things now stand, Russia has succeeded in concluding a treaty of "non-intervention" with Lithuania, while negotiations with Finland, Esthonia and Latvia are still in train. With Poland there seems little hope of any far-reaching agreement being concluded.

In the Far East, during 1926 at least, Russia seems to have lost some ground. In spite of the successful termination of the dispute with Chang-Tso-lin over the control of the Russo-Chinese Railway, no material advantages can be said to have accrued to Russia in that direction. Not only did Chang-Tso-lin postpone the conference—to have been held at Mukden in May—where the Russians expected to extort some important concessions out of the northern Chinese, but it is even said that in September, he went so far as to adopt anti-Russian measures in Manchuria. Finally there came the Chinese demand for the recall by Moscow of the Russian envoy, Karakhan, from Peking. Russian relations with Japan, however, have remained superficially friendly.

In Europe, on the other hand, there seems a better prospect of Moscow coming to some kind of an understanding with France on the subject of the French loans to Russia. France may be thankful to receive payment of some kind, while Russia might yet come to regard that sacrifice as worth the purchase of French neutrality against Britain. The Russo-German Agreement was ratified on 29th June. Its importance is held in Germany to be not inconsiderable. The agreement has resulted in a German credit being made to Russia to an amount of 300,000,000 gold marks. The Russian relations with Great Britain require no commentary: they cannot be said to have improved as the result of the subsidies sent from Moscow to support the Coal Strike.

Towards the League of Nations the Soviets continued to be not only hostile but insulting; the *Isvestia* stigmatizes the League as a "wasp-nest of international lunatics where political sharpers and diplomatic swindlers play with marked cards . . . in order to violate weak peoples and hatch a world-war against Soviet Russia."

SOVIET MILITARY ORGANIZATION IN MONGOLIA

THE purely military effort made by the Soviets in Mongolia may be considered under two heads:—

- (1) The organization and training of the Mongolian army as a Soviet weapon.
- (2) The stationing of Soviet units and formations in—or in close support of—Mongolia.

(a) *The Mongolian Army*.—The Mongolian Army is to consist of:—
 36,000 mounted infantry (organized in about 120 squadrons).
 10,000 infantry (organized as 9 battalions).
 108 field guns (organized as 27 batteries).

(i) *Mounted Infantry*.

There are to be three "cavalry" divisions:—

1 division = 3 brigades.
 1 brigade = 3 regiments.
 1 regiment = 4-6 squadrons.

The men are armed with Russian rifles of various types, furnished from surplus war stock. Each regiment will have:—

1 M.G. detachment;
 1 engineer detachment;
 1 signal section.

Each squadron will have :—

2 light automatics (pack).

Note.—A report dated April, 1926, indicated that instead of three cavalry divisions the Soviet now propose that Mongolia should have one cavalry division and two infantry divisions; the latter trained and organized as Soviet rifle divisions.

(ii) *Infantry.*

Pending a decision regarding the infantry divisions mentioned in the foregoing note, there is to be one infantry brigade of three regiments :—

1 infantry regiment = 3 battalions.

1 battalion = 3 companies.

Each infantry regiment will have 1 M.G. platoon.

(iii) *Artillery.*

There are to be three divisions of artillery :—

1 artillery division = 3 artillery brigades.

1 artillery brigade = 3 batteries.

1 battery = 4 guns.

The armament has been supplied as a gift from the Soviet Republic. So far the guns and equipment for two artillery brigades (24 guns) have arrived, together with a considerable amount of ammunition.

(iv) *Air Force.*

The establishment of the Mongolian air force is believed to be two squadrons each of eight machines. So far, only three D.H. 4's and one Junker monoplane are believed to have arrived at the main aviation centre at Urga.

(v) *Command and Staff.*

The Headquarters of the Mongolian Army is at Urga. All important commands and staff appointments are filled with Soviet personnel, and the total number of Soviet instructors (including Soviet trained Mongols and Buriats) amounted in November, 1925, to 5,630.

(b) *Soviet Troops in or near Mongolia.*—It is not known exactly how many Soviet units are actually stationed in Mongolia. It seems clear, however, that there are some Soviet units stationed there and that they are to be retained in the country at the request of Mongolian Government officials.

Moreover, it is reported that the Soviet Government have agreed to station one infantry division and two cavalry brigades on the Mongolian frontier.

These dispositions indicate that Mongolia, acting under pressure from Moscow may not be long in making her declaration of independence, and that Moscow is prepared to afford some military guarantee against the consequences of such action.

FIGHTING IN NICARAGUA UNITED STATES' INTERVENTION

ON 6th February a Liberal force of 1,000 men attacked and captured the town of Chinandega on the Pacific coast. Heavy street fighting went on for three days, and the central part of the town was completely burned. The town was finally retaken by the Government forces. It is reported that 150 were killed and 400 wounded. The Liberals retired in good order, taking with them 700 men who joined them during the occupation of the town.

A few days later some 800 Liberals, with fifteen machine guns, defeated the Conservative troops near Matagalpa, a town over 100 miles from the Pacific coast. The Government, believing their forces to be inferior in number, evacuated the town and withdrew towards Metapa. At the same time they announced that their retreat was made in order to save the town from damage.

As a result of this fighting and the possibility of trouble at Leon, Granada and Matagalpa, British subjects were exposed to considerable danger. Moreover, at this juncture the United States representative at Managua was unable to guarantee protection throughout the extended area of the operations. The British Government accordingly decided to despatch H.M.S. "Colombo" to Nicaragua, stating that the ship would be used as a refuge for British subjects, if necessary, and that it was not intended to land troops. It was also hoped that the presence of a British warship in Nicaraguan waters would have a good moral effect. The "Colombo" arrived at Corinto on 26th February.

This action aroused certain political elements in the United States to a violent defence of the Monroe Doctrine, but an official announcement that the ship was only intended as a refuge and that no troops would be landed disarmed the critics. In practice, it proved rather useful to the U.S. Government Press as it provided an additional argument for the strong hand in Central America.

At the end of February, in consequence of the increase of their forces, the United States were in a position to guarantee protection to other nationals. The "Colombo" accordingly left Corinto on 5th March.

Meanwhile, Admiral Latimer, in command of United States forces, decided, with the consent of the Diaz Government, to land additional forces for the protection of the railway, in order to keep open communications between Managua and the sea. On 22nd February he also informed the contending parties that there was to be no fighting within 2,000 yards of the railway and towns along this line of communication.

On 24th February, Nicaragua made public the text of a treaty with the United States which had been proposed by General Diaz.

It provides for a loan of 20 million dollars for railway development, the funding of debt, and the settlement of claims arising out of the recent fighting. The United States is to provide a financial adviser and also a collector-general of all revenues. Instead of a Nicaraguan army a Nicaraguan constabulary is contemplated, trained by United States marine officers. The rights of the United States in connection with the canal through Nicaragua are confirmed. The proposed treaty also provides that Nicaragua shall not enter into a treaty with, or lease or sell territory to, any Power other than the United States without the consent of the latter. It is doubtful whether such a treaty will be signed at the present time.

Throughout the last months efforts have been made by various prominent Nicaraguans to start negotiations between the belligerents. It is reported that a mission recently left Managua with the intention of meeting General Moncada, who is in command of the Liberal forces, with the object of inducing him to give up the campaign. The grounds for discussion are stated to be that it is impossible for Dr. Sacasa's cause to triumph, and that if mediation is accepted, the United States will undertake to ensure free elections and the prosperity of the country. A later report states that the mission has met General Moncada at a small village in the mountains where there are considerable Liberal forces, and that the General is not unwilling to enter into negotiations provided the United States representative acts as mediator.

Later information shows, however, that hostilities between the rival political forces are still going on. In the early part of April, General Viquez, the Conservative military commander, claimed to have defeated the Liberal forces in two engagements in the neighbourhood of Muy Muy. A week later, however, the latter were preparing to recapture the city of Matagalpa, when Admiral Latimer stepped in and declared the city a neutral zone and armed troops were forbidden to approach within 2,000 yards. A number of other towns and districts have also been declared neutral zones.

United States seamen and marines guarding these areas and the railway line have, from time to time, been engaged with bands of insurgents carrying the red flag.

Mr. Henry L. Stimson, formerly U.S. Secretary for War, is the special agent of President Coolidge in Nicaragua. After a conference with the Conservative President Diaz, he has expressed readiness to meet the Liberal claimant and his military leader, but makes no specific request for such a meeting.

AN ITALIAN VIEW ON ALBANIA

ITALY'S interest in Albania is, and always has been, that Albania should not fall into the hands of a hostile or potentially hostile Power,

nor of any State which might be used as a catspaw by an unfriendly Power. Before the Great War Italian policy had been directed towards preventing Austria from securing control of Albania. From the outbreak of the Balkan wars in 1912 to the present day Italy has aimed at preventing either Serbia (Yugoslavia) or Greece from doing likewise, not so much from anxiety as to how those Powers would utilize their possession of the Albanian coast, as from anxiety lest either of them should become dependent upon some stronger Power possessing a large navy. The Albanian coast, being only a few hours' steam from the Italian coast, offers possibilities of developing bases for submarine attacks. Hence Italy attached great importance to the existence of an independent Albania.

At the time of the Treaty of London in April, 1915, Italy had agreed that, in exchange for a direct protectorate over Central Albania, the North of that country should be assigned to Yugoslavia and the South of Greece. After the Armistice there was a time when such a policy was again considered, as the control of Central Albania would have neutralized the dangers arising out of the possession of the rest of the country by other Powers. But the object was always the same, that is, the protection of the Italian coast from hostile attack. Even at the present day Italy's policy is still to support a wholly independent Albania.

Greece has, at all events for the moment, abandoned any idea of conquering Southern Albania (or Northern Epirus), but Italy has grounds for believing that Yugoslavia still aspires to conquer or dominate the whole or the greater part of the country for various reasons; amongst these are:—(1) The revival of the old historic tradition of the mediæval Serbian Empire under Stephen Dushan; (2) the Serbian desire to occupy the Albanian coast and secure one or more ports on the Adriatic not in the hands of the Croats whom they distrust; it would appear that the Yugoslavs hope to construct a railway to San Giovanni di Medua and Durazzo and thus be independent of the Dalmatian ports against the day when Dalmatia and Croatia may break away. (3) The existence of a very large number of Albanians in Yugoslav territory (about 500,000), as many purely Albanian districts were assigned for one reason or another to Yugoslavia, and the Yugoslavs are always anxious lest an Albanian Irredentist movement should arise in their country—a danger which some say would be best eliminated by suppressing Albania altogether as an independent State. These reasons explain the various attempts made by Serbia, and later by Yugoslavia, to conquer or gain control of Albania. During the Balkan war the Montenegrins occupied Scutari and the Serbs Durazzo; they were only induced to evacuate those places by the pressure of the Great Powers. During the Great War, the Albanian mirage attracted the Serbs and was largely responsible for the Serbian *débâcle*, as they refused to attack the Austrians in the spring of 1915 when Italy entered the war, and

when there were only a few tired Austrian divisions between the Save and Agram. At that time the British, French and Russian Governments had urged them to do so on the grounds that they must look towards Albania.

In 1921 Yugoslav troops invaded certain Albanian districts and were only induced to evacuate them by the intervention of the Great Powers acting through the League of Nations. Two years ago, when Monsignor Fan Noli was in power in Albania, the Yugoslavs believed him to be too pro-Italian for their taste, and there ensued the revolution which brought Ahmed Bey Zogu, then an exile in Belgrade, into power. Ahmed was regarded by the Yugoslavs as an instrument of their own, and was provided by them with funds for the movement. He armed the rebels and even gave them Serbian officers. But once in power Ahmed Zogu proved less amenable to Yugoslav influences than had been expected; he seems to have concluded that there was a better chance of real independence and material progress for Albania through friendship with Italy than with Yugoslavia. In short, the Yugoslavs found that they had made a bad bargain.

Another revolution was hatched in Albania directed at ousting Ahmed Zogu. The outbreak at Scutari last year was a first attempt, but it failed. This spring a movement was prepared on a much larger scale. Arms and munitions were accumulated on the frontiers, Comitadji bands (Albanian malcontents and Serbs) were organized. These latter would undoubtedly have engineered a new invasion of Albania had not Italy intervened and revealed these preparations to the other Powers.

The Tirana Treaty, to which the Yugoslavs have raised objection, is a guarantee on Italy's part to protect Albania against aggression, whether in the form of a direct attack or in that of a revolution engineered from outside in order to place a government in power which should be the puppet of some other State. It is, in fact, a reinforcement by Italy with regard to Albania of the general obligation undertaken by all States members of the League of Nations to protect each other's integrity against aggression (Article 10 of the Covenant). Only a Power meditating an act of aggression against Albania would therefore have any reason to object to the Treaty.

It may be argued that the Treaty places Albania under a sort of Italian protectorate; but this protectorate would only be operative in the case of an act of aggression by some other Power. Italy has no intention of exercising direct control over Albania and has no interest in doing so. The story that Italy wants to colonize Albania with her own surplus population is baseless, as those who know anything about Albanian conditions and resources will realize.

The episode was made to appear somewhat graver than might have been otherwise, by the manifest friendship shown for Yugoslavia by France. This friendship did not only consist of newspaper articles,

since Italy claims to possess abundant and irrefutable evidence that it even took the form of supplies of arms and munitions that were being shipped to the Yugoslav ports.

The movement, however, has fizzled out, owing to the publicity given to it; and should an inquiry be held on the frontier districts, as Italy had agreed, probably no traces of hostile preparations would now be found, as there has been plenty of time to spirit them away.

In Western Europe, or indeed in any civilized area, an episode of this kind would have been very serious, but in the Balkans it should not be taken too tragically, as the Balkan nations have been accustomed to this sort of political manoeuvre for the past two thousand years.

CORRESPONDENCE

[Correspondence is invited on subjects which have been dealt with in the JOURNAL, or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, and publication of letters will be dependent on the space available in each number of the JOURNAL.—ED.]

ON WRITING APPRECIATIONS.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In the article "On Writing Appreciations" in the November number of the JOURNAL, the question of whether the *object* or the considerations affecting its attainment should be put first is briefly discussed.

In all probability it will be agreed generally that as soon as a definite limited object—something more definite than such a generality as to "beat the hostile army" or "obtain command of the sea"—can be clearly discerned, it should be put down, in order that thought may be focussed on its attainment.

The question then becomes "At what stage of an appreciation does it become clear what the object is?" A very little thought should show that in the vast majority of military problems—and probably of naval and air force problems, too—the object can be set down at once.

Subordinate commanders must at all times have their immediate mission given to them from above, and it is only occasionally that even a commander-in-chief must pause to ask himself what his object shall be, and to review all the factors in the case before he can decide. In such cases the question almost always is, either: "shall I attack or leave the initiative to the enemy?" or "on which front shall I attack?" Examples of a situation provoking the former question are that confronting Sir John Nixon in November, 1915, after the first battle of Kut; that confronting Prittwitz in August, 1914, after the battle of Gumbinnen; and the situation which Ludendorff had to face in the winter of 1917-18. An example of the latter kind of problem is the question which the British Cabinet had to decide in January, 1915, i.e., whether all the British military strength in Europe should be devoted to the Western Front, or whether any military effort should be made at Gallipoli; while the problem of where the next big attack should be made had constantly to be solved by the German High Command.

It appears then that the military method of noting the object first is the correct one. In nearly all cases it can be set down at once, and on the rare occasions when it is not clear at the outset, the noting of the possible alternative objects is likely to direct consideration of the various factors in the case into the right channels.

Tanglin, Singapore.
10th March, 1927.

Yours, etc.,
C. F. STOEHR, Major.

THE ROYAL NAVY AND THE PUBLIC SCHOOLS.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—I am of opinion that the system of training our naval officers at our Royal Naval College is vastly superior in every way to allowing them to remain at Public Schools, where they are not taught true patriotism and devotion to the Service, which is so vital. Besides this the education and training at the Royal Naval College is so much more economical for the parents. Our Naval Cadets, during their long vacations, associate with Public School boys and can hold their own with them very satisfactorily.

Yours, etc.,

G. BOWRING, Lieut.-Colonel,
(Retd.), Indian Army.

26th February, 1927.

"LIEUTENANT HORATIO NELSON."

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—An intriguing puzzle was propounded in the November issue of the JOURNAL in the shape of a portrait of a naval officer labelled "Lieutenant Horatio Nelson." At first sight, it might be supposed that the illustration here reproduced represented Lord Nelson as a Lieutenant, but very little investigation should suffice to dissipate this impression. Whom, then, does the portrait represent?

Well authenticated portraits of Nelson are few in number. The earliest, showing him as a Captain, in 1781, was painted by John Francis Rigaud, and is now in the possession of the Nelson family. All the others were painted after he became a flag officer. It is true there are several alleged portraits of Nelson as a Midshipman. One of these is reproduced in "Nelson in England," by E. Hallam Moorhouse (1913). It is stated to be in the possession of Lady Llangattock. Another forms the frontispiece to Mr. G. Lathom Browne's "Nelson" (1891). This is reputed to have been painted by Gainsborough, but no evidence is produced to bear this out. More recently, it was reported that the Treasury were in negotiation for the purchase of a portrait reputed to be painted by Romney, but it seems likely, at least, that if this artist had painted any picture of Nelson, the fact would have been referred to in one of the latter's biographies.

The chances of Nelson ever having had his portrait painted as a Lieutenant are slight. He was made an acting Lieutenant in the "Worcester," for a voyage to Gibraltar, on 26th September, 1776, and immediately on returning home passed his examination, on 9th April, 1777. The next day he was appointed to the "Lowestoffe," and went to the West Indies, where he exchanged into the "Bristol," on 2nd July, 1778. In December of the same year he became Commander of the "Badger." Therefore, counting the time he was acting, he was a Lieutenant for only a little over two years, and at the most was at home during this period for but a few weeks. He certainly never wore side-whiskers at any time.

The next point arises in connection with the uniform of the officer in the picture reproduced in the November number. It will be seen that he is wearing two epaulettes. It was not until 23rd March, 1812, that in the Regulations, Lieutenants were given one epaulette (plain) on the right shoulder, and nothing on the left. This concession was made the occasion of some amusing "Lines Addressed to Lieutenants, R.N., on the Change of Uniform on August 12, 1812"

(published on page 296 of Vol. XXVIII of the *Naval Chronicle*). Here are three of the verses :—

Ye gallant subjects of Old Davey,
The jolly luffs of Britain's Navy,
Come listen to my lay ;
With hope light up your rugged faces
Like eager cruiser when she chases
And chides her tardy way.

* * * * *

Your claims so often urg'd in vain
To that bright prize you've bled to gain
The Regent Prince admits ;
That you may be allowed to wear
The Epaulette—badge proud and fair
He graciously permits.

* * * * *

Now with slash'd sleeve and epaulette
And trimmed cock'd hat with neat rosette
You yield the palm to no men.
With regulation sword and knot
So bold and smart—you will I wot
Be the delight of women.

The regulations for the Lieutenant's uniform also prescribed white facings and a slashed sleeve, and so far conform to the dress in the picture. But the lace round the lapel and down the edge of the coat, and the omission of a white cuff, are contrary to those Orders.

On 1st January, 1825, new Regulations were issued, which prescribed white lapels, "to button back as before," but without the slashed sleeve or lace to the coat, and only one epaulette. Further new Regulations, on 18th December, 1827, the next to be issued, show that the white lapels had disappeared, but on the left shoulder was to be worn a strap similar to the strap of the epaulette on the right shoulder. Now, too, trousers took the place of white cloth or kerseymere pantaloons or breeches, though these might still be worn at the King's or Queen's drawing rooms. It was not until 1843 that Lieutenants got their second epaulette.

In the light of these Regulations, it might be supposed that the picture was that of an officer who was a Lieutenant somewhere between 1812 and 1827, although there are still a few discrepancies, as the two epaulettes. But the Navy List shows that the only officers of the name of Nelson between those dates were Captain Charles Nelson, of 9th October, 1822, and Lieutenant Coote Carroll Nelson, of 26th September, 1829. It is not until 28th September, 1844, that we find a Mate, Horatio Nelson, who was confirmed as Lieutenant on 9th November, 1846, and it is not until 21st May, 1852, that another Lieutenant of the name, the Hon. Maurice Horatio Nelson, appears in the Navy List.

It seems hardly likely that the Lieutenant Horatio Nelson of 1844 can have worn a uniform like this in the portrait, and the Hon. Maurice Horatio Nelson is, of course, much too late. It is a pity that O'Byrne's "*Naval Biography*" gives no indication of the family of the former, and there is also the difficulty that the uniform as shown does not agree entirely with any of the Regulations.

I must admit that these notes do not provide a complete solution to the puzzle, but they may help to clear up some erroneous notions on the subject and perhaps lead to a definite decision.

Yours, etc.,

CHAS. N. ROBINSON,
Commander, R.N. (Retired).

[The above letter elaborates other Correspondence received on this subject. The present Earl Nelson and Captain M. H. H. Nelson, R.N., have been communicated with and are unable to trace the original of this portrait which, unless any Member can enlighten us, must remain, for what it is worth, that of a "Lieutenant Horatio Nelson."—EDITOR].

ESTABLISHMENTS AND RETURNS.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—On reading the article on "Establishments and Returns," by R.A.M.C., in the November issue of the R.U.S.I. JOURNAL, I feel that he has indulged in humour; he must imagine that the method, if method it can be called, by which an Establishment is prepared is that someone thinks of a number, doubles it, adds his age and then says that the result will be the Establishment of a Unit—otherwise he would not suggest that all Establishments should be in round numbers.

Should he be serious in his suggested "Round Number Establishments" may I suggest, very briefly, the method by which an Establishment is prepared? The first consideration in drawing up an Establishment is that there must be a very clear vision of the functions that the Establishment is required to perform; having got this, the requisite number of personnel to enable the Unit to carry out those functions is allotted. The next consideration is to try to reduce the cost of the Establishment (by the reduction of either the ranks or the numbers of the personnel) so that when the Establishment is sent for financial approval it is not possible for "finance" to press for further reductions. If these considerations are given the careful thought that they require it is obvious that the resultant total will rarely be a round number.

If the present total figure of any Establishment were reduced to the next "round number" some essential duty of the Unit would be jeopardised; if the present total figure were increased to the next highest "round number" additional and unjustifiable cost would be incurred and this cost would not be limited to one Unit, but it would be increased by the number of Units working to that Establishment.

Existing Establishments are provided to carry out existing duties and they cannot be increased without the justification of additional duties to be performed; they cannot be reduced because "finance" will have seen that all possible reductions have been made before they were issued.

R.A.M.C. must have viewed the subject of "Returns and Pro-Forma" from the limited vision of his own desk when he suggested that it is unnecessary to include the Establishment figures in any return dealing with strengths; it is well known that during a war it is very often necessary to amend an Establishment and thus amendments are promulgated in due course; how can anyone calling for a return of strengths, etc., be sure that the Unit rendering a return showing surpluses

and deficiencies is working to the amended or the old Establishment unless the figures of the Establishment are written on the return? The inclusion of the Establishment figures prevents that which we are all desirous of preventing, unnecessary correspondence.

R.A.M.C. touches the fringe of a matter which might have been included in the article by Major Lindsell in "Administrative Lessons of the Great War," when he suggests that there is often redundant information to be given in many returns sent in from the same Unit, but he does not carry his point to the logical administrative solution. In each Ministry, Command, and perhaps, Area, there should be a Civilian Statistical Branch, whose duty would be to collate, prepare and classify all existing data. No branch of the Ministry, etc., should be allowed to demand a return from Units, but should ask the Statistical Branch for the information required and they, and they alone, should be allowed to ask for a further return if the information cannot be supplied from their existing records.

I foresee the opposition to this suggestion, because it would mean the creation of further civilian staff; but, in practice, if this idea were carried out with method it should result in a decrease of the existing staffs, for there are at present civilian staffs in each branch dealing with the data from their own returns and were these to be centralised a reduction could be effected.

Decentralisation of statistics is false administration and every business concern of any magnitude has a centralised statistical department. There would seem to be no reason why this business arrangement should not be applied to the Services.

Tanglin Barracks, Singapore.
24th February, 1927.

Yours, etc.,
W. HODGSON, Lieutenant,
Duke of Wellington's Regiment.

CRUISER FUNCTIONS AND AIRSHIPS.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In Captain Thursfield's interesting lecture on the Functions of the Cruiser, he gives his opinion that "except in the one function of tactical reconnaissance, there is no present prospect of our being able to replace cruisers by aircraft." Vice-Admiral Sir H. W. Richmond also stated, in the course of the discussion, that "the functions of reconnaissance cannot be performed by aircraft by themselves." Are these views entirely correct?

If the above remarks applied to aeroplanes and seaplanes only, then few could disagree with them. "Aircraft," however, is a comprehensive term and includes airships. The two airships now building in this country should have a full speed of some 65 knots, and should be easily capable of covering 6,000 miles at 50 knots, and very much more at speeds comparable to those of the fastest surface craft. The size of these ships has but to be doubled to enable them to reach any part of the world and return without re-fuelling. Surely such aircraft are capable of strategical reconnaissance in the widest sense? If based on Canada, where our helium supply is to be found, they can be employed in the Atlantic or Pacific, as required, at the shortest notice. When filled with helium these airships are quite immune to incendiary attack, and when protected by gas-armour, nearly so. They can therefore stand up to aeroplanes carried by a hostile fleet, and should be able to maintain contact as well as a surface cruiser.

When the Admiralty are in a position to design and build such airships to suit their special requirements and have them under their undivided control, then, I maintain, there is a definite prospect of aircraft replacing some cruisers.

The Germans, who have experience in the matter, consider that one airship can perform the duties of four light cruisers in certain conditions. Admiral Lord Jellicoe bears testimony to the efficiency of airships in his book. The United States, Italy, France and Japan have airships working with their fleets to-day, and Russia is about to follow their example. The British Navy has none!

We failed to win the Battle of Jutland for want of an airship cruising with the Grand Fleet.

Yours, etc.,

The Airship Club,

F. L. M. BOOTHBY,

3, Clifford Street, S.W.

Captain, R.N. (Retired).

February, 1927.

GENERAL SERVICE NOTES

BRITISH FORCES IN CHINA

SHANGHAI DEFENCE.

The despatch of reinforcements to the British fleet in Chinese waters and of a Division under Major-General J. Duncan, C.B., C.M.G., C.V.O., D.S.O., to Shanghai, for the protection of British subjects and property, was recorded in the last JOURNAL. These forces have duly arrived and the following Navy, Army and Air Force units were concentrated in the latter locality at the end of April :—

NAVY.

Cruisers.—"Hawkins" (Flag of Vice-Admiral Sir Reginald V. Tyrwhitt, Bart., K.C.B., D.S.O., D.C.L., Commander-in-Chief); "Enterprise."

Aircraft Carrier.—"Hermes."

River Gunboats.—"Cricket"; "Widgeon"; "Woodcock."

Destroyer.—"Wolverine."

ARMY.

Details of the Defence Force were published in Army Notes of February last,¹ page 208; since then further reinforcements have been despatched. These consist of a brigade of infantry and ancillary units. The infantry battalions are :—

2nd Battalion Scots Guards.

1st Battalion The Queen's Royal Regiment.

1st Battalion The Northamptonshire Regiment.

2nd Battalion The Welch Regiment.

The force also included :—

The Headquarters of the 15th Infantry Brigade.

Detachments of the Royal Engineers, Royal Army Service Corps,
Royal Army Medical Corps.

These reinforcements sailed in two sections, leaving Southampton on 11th and 13th April respectively.

AIR FORCE.

British air force is chiefly represented at Shanghai by the flights of the Fleet Air Arm embarked in H.M. Aircraft Carriers "Hermes" and "Argus." The original twelve R.A.F. observers for Army co-operation work are, however, being reinforced by No. 2 (Army Co-operation) Squadron, which left Manston for Southampton on 30th April and sailed on embarking at that port.

¹ The 13th Infantry Brigade—1st Batt. Middlesex Regiment and 1st Batt. Cameronians—are in reserve at Hong Kong.

THE YANGTZE.

Early in April it was decided to evacuate the up-river areas and, the British Consuls and most of the British subjects having been sent down river, the river gunboats were withdrawn from Changking, Ichang, Shasi and Changsha. This means that there are, now, no British forces above Hangkow.

At the latter place is a flotilla of small craft, river gunboats, sloops and destroyers, under the command of Rear-Admiral J. E. Cameron, C.B., M.V.O., Senior Naval Officer, Yangtze, flying his flag in the river gunboat "Bee."

Owing to repeated cases of firing on British ships by the Chinese, the cruisers "Vindictive" and "Carlisle" were despatched to Hangkow on 17th April.

Lower down river one or more British warships are, normally, lying off Kiu-kiang, Wuhu, Nanking, Chinkiang and Woosung.

COAST PORTS.

The British Navy has, as usual, been represented during the quarter at Swatow, Ningpo and Amoy. Owing to trouble at Wei-hai-wei, the cruiser "Carlisle" was despatched there early in April.

WEST RIVER.

The disposition of naval forces in the West River has been normal. The river gunboats "Tarantula" (S.N.O.), "Cicala," "Moth" and "Robin" have been at Canton most of the quarter.

HONG KONG.

Hong Kong as the principal British naval base and dockyard in Far Eastern waters, has been the scene of much activity since reinforcements began to arrive for the China Station.

Naval forces based on Hong Kong at the end of April were as follows:—

Cruisers.—"Frobisher" (Flag of Rear-Admiral W. H. D. Boyle, C.B., commanding 1st Cruiser Squadron); "Danæ"; "Dauntless"; "Delhi"; "Dragon."

Destroyers.—"Bruce" (Flotilla Leader); "Sepoy"; "Somme"; "Sterling"; "Stormcloud"; "Thracian"; "Verity"; "Wanderer"; "Witherington"; "Wivern."

Sloop.—"Bluebell."

Minesweeper.—"Petersfield."

Submarine Depot Ships.—"Titania"; "Ambrose."

Submarines.—L.1; 2; 3; 4; 5; 7; 8; 15; 19; 20; 27; 33.

River Gunboats.—"Aphis"; "Ladybird."

Hospital Ship.—"Maine."

The military forces which form part of the normal garrison were enumerated in Army Notes, page 208, of the February JOURNAL; in addition, as already stated, the 13th Infantry Brigade belonging to the Shanghai Defence Force is in reserve at Hong Kong.

FOREIGN FORCES IN CHINA

SHANGHAI.

The principal Foreign Powers, except Soviet Russia, are all represented at Shanghai in varying degrees by naval or military forces.

The following were the foreign warships off that port and in the Lower Yangtze at the end of April :—

UNITED STATES.

Cruisers.—"Pittsburg" (Flag); "Richmond."

Destroyers.—Six, including one at Wuhu and a T.B.D. Tender.

Gunboat.—"Elcano."

JAPAN.

Cruisers.—"Tone" (Flag); "Abukuma"; "Hirado"; "Kuma"; "Sendai"; "Yahagi"; "Yakuno."

Destroyers.—Ten, including two at Wuhu.

Gunboat.—"Hira" (at Shazi).

FRANCE.

Cruiser.—"Jules Michelet" (Flag).

Despatch Vessels.—"Craonne"; "Marne."

ITALY.

Cruiser.—"Libia" (Senior Officer).

Spain, Portugal and Holland are also represented by one ship each.

Foreign landing parties reported to be available at Shanghai are :—

UNITED STATES.—2,550 seamen and marines. Further reinforcements of a nominal strength of 1,500 marines are being held in reserve.

JAPAN.—1,100.

ITALY.—150.

SPAIN.—150 seamen.

NETHERLANDS.—100 seamen.

The French authorities are making their own separate arrangements for the defence of their Concession. They have a mixed force of about 1,300 troops, police and local formations and a further battalion of infantry is *en route*.

HANGKOW.

At Hangkow the Foreign Powers are represented as follows :—

UNITED STATES.

Cruiser.—"Cincinnati."

Destroyers.—Four.

Gunboats.—Two.

Yacht.—"Isabel" (Flag).

JAPAN.

Cruiser.—"Tenryu."

Destroyers.—Five.

Gunboats.—Five.

FRANCE.

Despatch Vessel.—"Bellatrix."

Gunboats.—Two.

ITALY.

One destroyer; one gunboat.

The United States and Japan also have one destroyer and one gunboat each at Kiukiang.

A PUNITIVE EXPEDITION AGAINST PIRATES.

The Hong Kong Correspondent of *The Times* gives the following account¹ of the punitive expedition against Chinese pirates in Bias Bay, thirty miles North-east of Hong Kong, carried out by a squadron under the command of Rear-Admiral W. H. D. Boyle, C.B. :

"The aircraft carrier "Hermes," the cruisers "Frobisher," with Rear-Admiral Boyle on board, and "Delhi"; the mine-sweeper "Marazion"; and the sloop "Foxglove" were employed, and arrived in Bias Bay at midnight on Monday, 21st March.

A landing party, 300 strong, embarked in seventeen small boats at 2.30 a.m. under the command of Flag-Captain Calvert, the objective being two groups of hamlets, Kwaichau and Haichau, at the head of Fanlokong inlet, at the mouth of which pirated vessels are usually ransacked. The inlet is very shallow, and the "Marazion" performed a notable feat of navigation in towing the landing force ten miles. Owing to the difficulty of navigation the progress of the party was delayed, and day dawned before the beach was reached, with the result that the people of the villages had seen the warships and had retreated to the surrounding scrub.

The people were called together, the purpose of the expedition explained, and the villagers given a period of grace in which to remove their personal belongings. The villages, consisting of 130 stone and matting shacks, were then destroyed. Forty junks and sampans used for piratical purposes were also destroyed.

The landing force carefully refrained from destroying religious buildings, and rescued all livestock. No resistance was offered, and there were no casualties. The force re-embarked at 10.30 a.m. Aeroplanes co-operated in the operation, and the burning villages threw up a smoke which must have conveyed its lesson many miles.

The authorities had definite information that the inhabitants of these villages took part in at least three recent piracies, and one villager informed his questioners that five pirates from his village had bolted upon seeing the warships, and also stated that the whereabouts of five passengers, kidnapped from the steamer "Seang Bee" in January, might be discovered in an adjacent village, but time did not permit for a search to be made.

It is worthy of note that the Hong-Kong Government has frequently asked the Canton Government to co-operate in cleaning out Bias Bay, but Canton, while pretending to take action, merely sent expeditions against unruly district chieftains not in the pirate district. Recently Mr. Eugene Chen is reported to have told Mr. Teichman (of the British Legation in China) that the best method of curing the evil was for Great Britain to station a warship in Bias Bay. Although the duty of keeping Bias Bay free of pirates is Canton's, and the task of patrolling not difficult, Great Britain has now acted, and foreign opinion in the Far East unanimously approves of what has been done."

¹ *The Times* of 25th March, 1927.

IMPERIAL DEFENCE COLLEGE.

OBLIGATION OF OFFICERS ATTENDING COURSES.

It is officially stated that an officer selected to undergo a course at the Imperial Defence College will be required to sign an honourable undertaking to continue to serve in the Army, after the termination of the course, for a minimum period of five years if required to do so. This undertaking will not preclude the Army Council from releasing an officer from his obligation should circumstances justify release; but an officer who is permitted to resign his commission before the expiration of the period for which he undertakes to continue to serve, will be required to join the Regular Army Reserve of Officers.

War Office.

8th February, 1927.

COMBINED OPERATIONS IN ITALIAN SOMALILAND.

The following account is taken from an article in "Le Forge Amate" :—

Bender Kassim is considered to be the most important port of the Mizertini, being one of the few places of shelter on the inhospitable coast and also the centre from which lines of communication between the Gulf of Aden and East Africa branch out through the valleys of Karin and Darror.

Some 50 kilometres inland from Bender Kassim is the region of Karin, traversed by the caravan route from Haufun on the East to British Somaliland on the West. Last summer the occupation of this zone became very important for political and military reasons.

For this operation it was necessary to transport the 2nd Eritrean Battalion by sea from Haufun, the base created to a large extent by the efforts of the "San Giorgio" and "Campania" in the beginning of 1926. The battalion had, however, first to reconnoitre in the Alula zone, with the assistance of the gunboats "Alula," "Bernice" and "Palmaiola." The delay encouraged the rebels who intensified their raids into the Karin zone. On 18th July, a trader from Karin entered Bender Kassim and reported that his caravan had been stopped by armed rebels and compelled to return, and that several hundred armed rebels were making preparations to leave Karin to blockade the roads from Bender Kassim, to raid the Desciscia and to attack one of our parties sent out to reconnoitre. By means of the wireless of the cruiser "Taranto," the commanding officer of the Bender Kassim garrison was able to keep in touch with the military command of the Mizertini zone. He was also in a position to move all his forces into the interior at a moment's notice, as the presence of the "Taranto" ensured the town against attack.

Having received news of difficulties met with by his advance party, the garrison commander left Bender Kassim for the interior with a force of 100 men on 19th July, the remaining troops and the town being covered by the guns of the "Taranto." In a short time he was able to establish the advance party in the Karin redoubt and he then returned to Bender Kassim.

About the 25th July, however, the rebels again became active, and after burning huts and cultivated crops they attacked the redoubt in force. Patrols from Bender Kassim reported the presence of large numbers of armed rebels, who were greatly favoured by the difficult broken ground, and that the defending force

in the redoubt was replying but feebly to their assailants' fire. Prompt action was essential. The garrison commander required all his forces at Karin, and the Eritrean reinforcements had not yet arrived. Accordingly, on 27th July, the "Taranto" put ashore her landing party of 120 men and ten machine guns, took over the entire defence of Bender Kassim, and held the place until relieved by the military forces in the middle of August.

Meanwhile, despite rough seas and other navigational difficulties, the gunboats proceeded with the rapid transport of the Eritrean troops from Alula to Bender Kassim. On 31st July, the "Taranto" joined in the work and alone transported 300 men and 100 animals, disembarkation being effected in a few hours.

This valuable co-operation of the naval units with the Army materially assisted the occupation of Karin and led to the decisive defeat of the rebels.

PANAMA DEFENCES.

The Army Appropriation Bill for the fiscal year ending June, 1928, provides for the completion of the anti-aircraft defences of the Panama Canal and for the installation of two more 16-in guns at Bruja Point. This will bring the total there to four 16-in. guns.

The foregoing decision is of interest as indicating that, in spite of the development of aircraft, the United States military authorities have not yet abandoned the heavy fortress gun for the defence of vital localities.

NAVY NOTES

GREAT BRITAIN.

THE NAVY ESTIMATES.

The Navy Estimates for 1927 were published on Thursday, 10th March, accompanied by the Statement of the First Lord (Cmd. 2816). The net total is £58,000,000, a reduction of £100,000 on the previous year, in spite of an increase in the cost of new construction from £9,083,693 to £9,983,446, and extra charges of nearly a million sterling for causes beyond Admiralty control, such as deferred liabilities due to the coal stoppage. That a reduction was still possible was mainly owing to administrative economies, a contribution by the Malay States towards the cost of Singapore, deferred provision of the personnel for the "London" class cruisers, and an extension of the period between dockyard refits of ships.

NOTES ON NAVY PROGRESS.—As in past years, the First Lord furnished some "Notes on Matters of General Interest" to accompany the Estimates. These deal with a number of matters already referred to in the JOURNAL under the headings of distribution of the Fleet; co-operation with the Dominions and India, and between the Services; the cruise of H.M.S. "Renown"; loss of the "Valerian"; work of the Navy in China, the Red Sea, the Tangier Patrol, etc.; general fleet training, naval air work, matériel, research work and the introduction of short-wave wireless for long distance communication are also dealt with.

FLEET PERSONNEL.—The section of the "Notes" dealing with this subject records the presentation of the report of the Chelmsford Committee on the Executive Officers' lists, the recommendations of which have been generally adopted. A few amendments are being made in the rules for retirement of Flag Officers, and the zones from which officers are selected for promotion to Commander and Captain have been modified in accordance with the Committee's recommendations. A voluntary retirement scheme for the older Lieutenant-Commanders has been instituted; in order to increase the spreading out of the ages of officers on promotion to Lieutenant, the time award given to cadets on leaving Dartmouth or the training ship is being doubled. The personnel proposed for 1927 is 102,275, or 400 less than last year.

NEW CONSTRUCTION.—The programme for 1927 is according to the Schedule approved in July, 1925, except that in place of four motor launches not begun in 1926, two mine-sweepers will be put in hand of a new type combining the functions of sloops and sweepers. Two "B" Class cruisers will be laid down at Portsmouth and Devonport Dockyards, and the rest of the programme put out to contract, viz.: one "A" cruiser, one flotilla leader, eight destroyers, six submarines and two mine-sweepers. The repair work in hand includes the bulging of the "Queen Elizabeth," the conversion of the "Centurion" into a target ship, the re-tubing of the "Resolution," and the reconstruction of the "Courageous" and "Glorious" as aircraft-carriers, of which the former will be finished in 1927 at an expenditure of £2,025,800, or more than her original cost.

FIRST LORD ON THE ESTIMATES.—The Estimates were introduced into the House of Commons on Monday, 14th March, when Mr. Bridgeman said that the Admiralty had inserted £125,000 for future expenses in connection with the sending of ships to China. If the ships and men should be detained there, it would be necessary, as in the case of the War Office, to bring in a Supplementary Estimate. After referring to the extra cost of construction and other special liabilities, the First Lord said that on the other side there were savings of £150,000 owing to the new rates of pay for new entrants, £200,000 on the prices of food and clothing, and other economies by the closing of Rosyth and Pembroke. Also, the surplus stores were to be drawn on to the extent of £927,000, as against £726,000 last year.

NEW FIRST SEA LORD.

On 30th April, it was announced that H.M. the King had approved the appointment of Admiral of the Fleet Sir Charles E. Madden, Bart., G.C.B., G.C.V.O., K.C.M.G., LL.D., to be a Lord Commissioner of the Admiralty and Chief of Naval Staff in succession to Admiral of the Fleet Earl Beatty, G.C.B., O.M., G.C.V.O., D.S.O., D.C.L. (Oxford), LL.D., to date 30th July, 1927.

THE FLAG LIST.

ATLANTIC FLEET COMMAND.—On 11th March, the Admiralty announced that the King had approved the appointment of Vice-Admiral the Hon. Sir Hubert G. Brand, K.C.M.G., K.C.V.O., C.B., to be Commander-in-Chief of the Atlantic Fleet, in succession to Admiral Sir Henry Oliver, K.C.B., K.C.M.G., M.V.O., to date 15th August, 1927. On this date Sir Henry Oliver completes three years in the post. Vice-Admiral Brand is at present Second Sea Lord and Chief of Naval Personnel.

NEW SECOND SEA LORD.—On 8th April, it was announced that the King had approved the appointment of Vice-Admiral Sir Michael H. Hodges, K.C.B., C.M.G., M.V.O., to be Second Sea Lord and Chief of Naval Personnel vice Vice-Admiral Brand.

DEATH OF VICE-ADMIRAL FITZMAURICE.—We regret to record the death, which occurred on Sunday, 23rd January, after a sudden seizure, of Vice-Admiral Sir Maurice Fitzmaurice, aged fifty-six. He had nearly completed his tenure of the post of Commander-in-Chief, Africa Station, and Rear-Admiral David Murray Anderson was on the way out to relieve him. Sir Maurice was P.N.T.O. at the Dardanelles and Salonika, Chief of Staff in the Eastern Mediterranean, and S.N.O. on the Coast of Palestine, during the late war; and afterwards became Director of Naval Intelligence. On his death, Captain J. C. Hodgson, Captain-in-Charge at Simonstown, hoisted his broad pennant as Commodore, first class, in the "Flora" as acting Commander-in-Chief pending the arrival of Rear-Admiral Anderson.

FLAG PROMOTIONS.—Consequent on the death of Vice-Admiral Fitzmaurice, the following promotions were announced by the Admiralty with effect from 24th January:—Rear-Admiral D. M. Anderson to be Vice-Admiral; Captain W. M. Kerr, C.B.E., A.D.C., to be Rear-Admiral. The following promotion was also made on the retired list:—Rear-Admiral D. B. Crampton, C.B.E., D.S.O., M.V.O., to be Vice-Admiral. A week later, on 1st February, it was announced that Rear-Admiral John E. T. Harper, C.B., M.V.O., had been placed on the retired list, to date 1st February, and in succession Captain H. Percy Douglas, C.M.G., Hydrographer of the Navy, was promoted to be Rear-Admiral.

DOCKYARD POSTS.—On 20th January, the selection was announced of Rear-Admiral Oliver Backhouse, C.B., to be Admiral-Superintendent of Devonport Dockyard, in succession to Rear-Admiral L. C. S. Woolcombe, to date 1st March; and of Rear-Admiral L. A. B. Donaldson, C.B., C.M.G., to be Admiral-Superintendent at Portsmouth, in succession to Rear-Admiral B. S. Thesiger, C.B., C.M.G., to date 13th May, 1927.

NEW REAR-ADMIRAL (S.).—On 31st March, the appointment was announced of Rear-Admiral Henry E. Grace, C.B., to be Rear-Admiral of Submarines, in succession to Rear-Admiral Vernon H. S. Haggard, C.B., C.M.G., to date 1st September, 1927.

OTHER CHANGES.—The following further changes in senior commands and posts were announced by the Admiralty on 16th April:—

Rear-Admiral William A. H. Kelly, C.B., C.M.G., M.V.O., to "President," additional, as Admiralty representative on the League of Nations Commission, in succession to Vice-Admiral (retired) Aubrey C. H. Smith, C.B., M.V.O., to date 30th September.

Rear-Admiral Bernard St. G. Collard, C.B., D.S.O., to be Rear-Admiral in the First Battle Squadron, Mediterranean Fleet, in succession to Rear-Admiral D. T. Norris, C.B., C.M.G., to date 1st October.

Rear-Admiral Bertram S. Thesiger, C.B., C.M.G., to be Commander-in-Chief, East Indies Station, in succession to Vice-Admiral Walter M. Ellerton, C.B., to date 5th October.

Rear-Admiral Hugh J. Tweedie, C.B., to be Rear-Admiral and Senior Naval Officer, Yangtze, in succession to Rear-Admiral John E. Cameron, C.B., M.V.O., to date 19th August.

Captain Barry E. Domville, C.B., C.M.G., A.D.C., to be Director of Naval Intelligence Division of the Naval Staff, in succession to Rear-Admiral A. G. Hotham, C.B., C.M.G., to date 15th August.

NEW MEDICAL DIRECTOR-GENERAL.—Surgeon Rear-Admiral Arthur Gaskell, C.B., O.B.E., was, in February, selected for the post of Director-General of the Medical Department of the Navy, in succession to Surgeon Vice-Admiral Sir Joseph Chambers, K.C.B., C.M.G., to date 1st July. The former officer was in charge of the Royal Hospital, Plymouth, from August, 1923, to October, 1926.

FLAG RETIREMENTS.—As a result of the recommendations of the Committee on certain questions relating to the executive lists, presided over by Lord Chelmsford, a few amendments are being made in the rules for retirement of Flag Officers. Admirals of the Fleet, promoted to that rank subsequently to 7th February, 1927, are to be retired as soon as five years have elapsed since their date of promotion, but if an officer is then actually employed, the period of five years may be extended up to the date of reaching the age of sixty-five, or of ceasing employment, if earlier. The rule under which Admirals and Vice-Admirals may be retained on those lists for a period of one year before being retired on account of non-service is to be abolished in respect of officers promoted to the ranks of Admiral or Vice-Admiral subsequent to 7th February, 1927. A third new regulation is:—"Rear-Admirals to be retired on promotion to Vice-Admiral at Admiralty discretion, should it be decided not to offer them further employment, provided that if employed afloat when their turn comes for promotion, they shall be retained on the active list until the termination of their appointments."

NAVAL ACTIVITIES IN CHINA.

See "General Service Notes."

PERSONNEL

NAVAL CADETS' TIME.—In order to increase the spreading out of the ages of officers on promotion to Lieutenant, the time award given to Naval Cadets on leaving Dartmouth College or the training ship is being doubled. For a 1st Class certificate, the time gained is increased from two months to four; for a 2nd Class from one month to two; but no time is allowed for a 3rd Class. The revised regulations begin with the Naval Cadets passing out of Dartmouth in April, 1927; Midshipmen from mercantile training establishments passing out of the training ship in January, 1928; and special entry Midshipmen passing out of the training ship in September, 1928.

EX-WARRANT OFFICERS' PAY.—By Fleet Order, dated 4th March, lower rates of pay were brought into operation for (a) Officers who immediately prior to promotion to warrant or higher rank were in receipt of pay on the scales applicable to men entered subsequent to 4th October, 1925; or (b) those who have been or may be entered from civil life in warrant or higher rank after 16th October, 1926, e.g., Schoolmaster, R.M., Director of Music, R.M., Musical Director, R.N. School of Music, and Skipper, R.N.R. The scales of pay for warrant officers of all branches of the R.N. and R.M., R.N.R., and R.N.V.R., will remain as at present.

GOODENOUGH MEMORIAL PRIZE, 1926.—The Goodenough Memorial Prize for the year 1926 has been awarded to Lieutenant J. D. M. Robinson, R.N., H.M.S. "Canterbury."

NAVAL HISTORY PRIZES.—The undermentioned officers have been awarded prizes on the result of the annual examination in Naval History for 1926:—Lieutenant J. R. Henderson, H.M.S. "Carlisle," prize of £50 and medal; Lieutenant D. O. Doble, H.M.S. "Weymouth," prize of £30; Lieutenant T. J. N. Hilken, prize of £20; Lieutenants C. A. Jenkins, R. C. V. Ross and C. R. Townsend, prize of £5 and certificate of merit each.

PAY REDUCTION.—Fleet Orders of 4th February notified that as the average cost of living index figures for six months ending 31st December, 1926, was 74, the standard rates of naval officers' pay from 1st July, 1927, to 30th June, 1930, will be reduced by 6 per cent., in place of the present 5½ per cent.

CEREMONIAL MUSIC.—In addition to those specified in Chapter II of the King's Regulations and Admiralty Instructions, the following airs have been approved to be played by Naval and Royal Marine Bands on the authorized occasions, viz.:—

- (i) General Salute for British Flag Officers not entitled to "Rule Britannia" "Iolanthe."
- (ii) General Salute for Governors, High Commissioners, etc., British General Officers and Air Officers, Foreign Officers and Officials, "Garb of Old Gaul."
- (iii) March Past for the Royal Navy "Hearts of Oak."
- (iv) March Past for the Royal Marines "Life on the Ocean Wave."
- (v) Advance in Review Order "Nancy Lee."

RYDER PRIZE FOR 1926.—A Ryder Memorial Prize for 1926 was awarded in March, 1927, to Acting Sub-Lieutenant D. Grove-White, R.N., of the "Excellent," who passed the best examination in French in the Sub-Lieutenants' educational courses at the R.N. College, Greenwich, during the former year.

SERVICE IN SUBMARINES.—Revised rules governing the service of ratings in submarines, published in a Fleet Order on 18th March, showed that the normal

period of such service for non-volunteer ratings will be five years, instead of three as hitherto.

LIFE SAVING AWARDS.—The Royal Life Saving Society notify that the King's Cup for the best and most efficient work by clubs, schools, etc., during 1926, in promoting the objects of the Society has been awarded to the Royal Naval College, Dartmouth. The General Excellence Trophy, open to mercantile training ships and other establishments for the training of boys for entry in H.M. Service, has been awarded for 1926, to the Royal Hospital School, Greenwich.

NEW TRAINING ESTABLISHMENT.—The new Training Establishment for Boys at Forton Barracks, Gosport, in the buildings formerly occupied by the R.M.L.I., is to be known as H.M.S. "St. Vincent," thus perpetuating the name of the training ship for many years in Portsmouth Harbour. It will be commissioned on 17th May, when steam launch No. 288 is being renamed "St. Vincent." Captain P. L. H. Noble, C.V.O., from the Shotley Training Establishment, will be the first Commanding Officer.

MATERIAL.

THE "NELSON" CLASS.—H.M.S. "Nelson" is expected to be completed in July next. Captain the Hon. M. R. Best has been in command of her during trials, and will be succeeded on July 1st by Captain S. J. Meyrick. The period of construction will then have been four years and seven months, and the cost £6,483,879. The "Rodney" is expected to be completed in September next, and Captain H. K. Kitson will command her. The period of her construction will have been four years and nine months, and the cost £6,566,884. If armament is to include ammunition and reserves, £921,390 must be added for each ship. The "Nelson" and "Rodney" are to join the Atlantic Fleet, and the remainder of the "Royal Sovereign" class will then be transferred to the Mediterranean.

NEW SHIP NAMES.—The names given to the ships of the 1926 programme are as follows:—"A" class cruisers, "Dorsetshire," building at Portsmouth Dockyard; "Norfolk," at the Fairfield yard, Govan; "B" class cruiser, "York," at the Palmers' Company, Jarrow; submarine depot-ship, "Medway," and repair ship, "Resource," at the Vickers yard, Barrow-in-Furness.

DESTROYER TRIALS.—In March, the new destroyers "Amazon" and "Ambuscade," laid down at the end of 1924, and the first of their class to be built since the war, carried out their official trials. On 12th March, the "Amazon" made a mean speed during a six hours' trial of 37.47 knots. Her mean speed over a measured mile was 37.96 knots. The "Ambuscade" also completed her trials with success, averaging 37 knots.

NEW SUBMARINES.—The six submarines of the 1926 programme are to be named as follows:—"Odin," to be built at H.M. Dockyard, Chatham; "Olympus," and "Orpheus," by Messrs. Beardmore & Co., Dalmuir; "Osiris," "Oswald" and "Otus," by Messrs. Vickers, Ltd., Barrow-in-Furness. The "Oberon," laid down in March, 1924, was due to complete on 20th April, 1927. The first of the two Australian submarines of similar design, the "Oxley" was commissioned on 1st April, with a full complement, as tender to the "Dolphin."

MINELAYER COMPLETED.—The cruiser-minelayer "Adventure," built at Devonport Dockyard, was ordered to be commissioned on 20th April, and to leave for Portsmouth on the 29th to carry out trials. The "Adventure," to which Captain P. E. Parker, D.S.O., has been appointed in command, is to replace the "Princess Margaret" in the Atlantic Fleet, the latter ship being paid off on to the sale list.

NEW RIVER GUNBOATS.—The four new river gunboats "Petrel," "Tern," "Gannet" and "Seamew" are all due to complete this summer or autumn and will relieve the "Woodcock," "Woodland" and "Robin" in Chinese waters.

EXERCISES AND CRUISES.

ATLANTIC AND MEDITERRANEAN FLEETS.—During the first fortnight of March, the Atlantic and Mediterranean Fleets, commanded respectively by Admirals Sir Henry Oliver and Sir Roger Keyes, assembled in the Straits of Gibraltar for combined exercises. The totals of the ships of the various classes were:—Battleships, 10; battle-cruisers, 2; cruisers, 11; flotilla leaders, 5; destroyers, 38; submarines, 6; minelayer, 1; and aircraft-carriers, 2. A tactical exercise was first carried out between the Atlantic (Red) Fleet and the Mediterranean (Blue) Fleet, on 3rd March, in the vicinity of Cabo de Gata, after which the Atlantic Fleet went to Lagos, Portugal, and the Mediterranean Fleet to Gibraltar. A strategical exercise was carried out between 9th and 11th March, the Atlantic Fleet numbering 5 battleships, 2 battle-cruisers, 5 cruisers, 18 destroyers and leaders, and the aircraft-carrier "Furious"; and the Mediterranean Fleet, 5 battleships, 6 cruisers, 23 destroyers and leaders, 6 submarines, and the aircraft-carrier "Eagle." Correspondents of the press were permitted on board certain ships to describe the progress of the exercises.

SOUTH AMERICAN CRUISE.—The cruiser "Capetown," Captain O. H. Dawson, made a cruise in South American waters during the past quarter, calling at Rio de Janeiro, Santos, Montevideo, Buenos Aires, the Falkland Islands (where her ship's company took part in the unveiling on 25th February of the memorial to commemorate the victory of Admiral Sturdee), Punta Arenas, Valparaiso, Coquimbo, Antofagasta, and other ports, returning to her base via the Panama Canal.

WEST INDIAN CRUISES.—Vice-Admiral Cowan's flagship, the "Calcutta," cruised in the West Indies from January to March, visiting St. Lucia, Georgetown, Port of Spain, Tobago, Barbados and Antigua. The "Colombo," Captain A. M. Lecky, D.S.O., at the same time visited St. Vincent, Barbados, Grenada, St. Lucia and other places.

CRUISER IN NICARAGUA.—At the request of the British Chargé d'Affaires at Managua, Nicaragua, the cruiser "Colombo" proceeded there at the end of February, passing through the Panama Canal on the 24th, and arriving at Corinto on the West coast of Nicaragua, on the 26th. She left again on 5th March, the diplomatic authorities deciding that her presence was no longer necessary, since sufficient American forces had been landed for the protection of foreign life and property. The "Colombo" arrived at Vera Cruz on 14th March, and Captain Lecky and ten officers visited President Calles in Mexico City.

FLEET AIR ARM.

ADMIRALTY COMMITTEE.—The Board of Admiralty on 12th February appointed a Committee, with Rear-Admiral W. M. Kerr, C.B.E., as Chairman, to consider the desirability of including in the general education of Junior Naval Executive and Royal Marine Officers instruction in aviation. One of the members of the Committee is a representative of the Air Ministry. The Committee will investigate the best means of giving these officers such a course as will provide them with a groundwork in the principles of naval air work, and fit them to appreciate its value, capabilities and limitations.

CARRIERS' ARMAMENT.—The Return of Fleets (Cmd. 2809), issued on 3rd March, contained details of the armament to be carried by the "Courageous" and "Glorious," under conversion to aircraft-carriers at Devonport. They will each have eighteen 4.7 in. guns and eighteen smaller guns, thus differing from the other carriers, as the "Hermes" has seven 5.5-in. and three 4-in. A.A. guns; the "Eagle," nine 6-in. and five 4-in. A.A.; the "Furious," ten 5.5-in. and six 4-in. A.A.; and the "Argus," six 4-in. A.A.

OBSERVERS' COURSE.—Dates for the present course for officers qualifying as naval observers are:—Gunnery course in H.M.S. "Excellent," 4th April to 3rd May; signal course in H.M. Signal School, 4th May to 22nd June; course at R.A.F. School of Naval Co-operation, commences 12th July.

MISHAP.—On 1st February, two machines, a Fairey Flycatcher and a Fairey 3.D seaplane, collided off Malta and fell into the sea, Lieutenant J. Y. Mills, R.N., being killed.

ROYAL MARINES.

ADJUTANT GENERAL, R.M.—Major-General Lewis S. T. Halliday, V.C., C.B., has been selected to succeed Lieutenant-General Sir Alexander R. H. Hutchison, K.C.B., C.M.G., D.S.O., as Adjutant General, R.M., to date 1st October, 1927. This appointment recalls the disturbances in China some quarter of a century ago. In June, 1900, the Boxers attacked the British Legation at Peking. Captain (as he then was) Halliday, of the Royal Marine Light Infantry, led a party of twenty Marines in a sortie and drove out the enemy forces which had occupied stable quarters and fired the West Gate. Severely wounded, Captain Halliday killed three assailants and then walked back to hospital, refusing aid so as not to diminish the strength of his party. For this act he was awarded the Victoria Cross.

NEW A.D.C.—H.M. the King has been pleased to appoint Colonel Commandant R. O. Paterson, O.B.E., an A.D.C., vice Finlaison, to date 10th February, 1927.

COLONEL COMMANDANT AT PORTSMOUTH.—On 10th February, Colonel Second Commandant A. G. Little, C.M.G., R.M., relinquished the post of Director of Naval Recruiting, on being selected as Colonel Commandant of the Portsmouth Division, and was succeeded by Lieutenant-Colonel G. R. S. Hickson, O.B.E., R.M., from the Chatham Division.

OTHER CHANGES.—Colonel Commandant J. B. Finlaison, C.M.G., A.D.C., retired on account of age, 10th February, 1927, with rank of Major-General.

Colonel Commandant J. A. M. A. Clark, C.B., C.M.G., placed on Half-Pay at own request, 9th February, 1927.

Colonel Second Commandant A. G. Little, C.M.G., promoted to Colonel Commandant vice Finlaison, 10th February, 1927.

Lieutenant-Colonel H. A. H. Jones, promoted to Colonel Second Commandant, vice Clark, 9th February, 1927.

R.M. BATTALION FOR CHINA.—On 14th January orders were received to dispatch a battalion 1,000 strong to China. The battalion, under the command of Lieutenant-Colonel George Carpenter, O.B.E., D.S.C., was concentrated at Eastney Barracks, Portsmouth, on 19th January, and sailed in S.S. "Minnesota" on 26th January. The First Lord in his speech on the Naval Estimates made the following reference to the incident:—

"We have sent out 1,000 Marines at very short notice. They were ready in three days from the time they were asked for, and several days before their troop ships were available. I think that is a very great testimony to the great efficiency of that magnificent force, the Marines, that in less than three days they were ready to go to those very distant parts of the world."

REDUCTION OF A MAJOR-GENERAL AND LIEUTENANT-COLONELS.—It has been decided to reduce one Major-General and three Lieutenant-Colonels from the establishment of the Corps. To minimise the effect on promotion as far as possible a temporary half-pay list for Lieutenant-Colonels is introduced for those who have completed four years in the rank, or have relinquished a staff appointment after four years in the rank. The Major-General has already been reduced; the three Lieutenant-Colonels will be reduced in six months time.

ANTE-DATE OF PROMOTION TO COLONEL.—The Army arrangement has been introduced under which an officer who has received a Brevet-Colonelcy or Brevet-Lieutenant-Colonelcy and who is subsequently promoted to Colonel may count seniority on the Colonels' list from the date of his brevet-colonelcy or four years from the date of his brevet-lieutenant-colonelcy, whichever is the more advantageous to him. Seniority in Corps rank is not affected.

ROYAL NAVAL RESERVE.

NEW BILL.—Moving the second reading of the Royal Naval Reserve Bill in the House of Commons on 15th March, the Parliamentary Secretary to the Admiralty said that it was intended to bring the existing law into line with existing practice. After the war it was decided to pay a bounty of £5 on mobilization to all men of the Reserve, and the new Bill sanctions this change in place of the 2d. a day after three years' service paid to certain classes of reservists previously. The second point alters the period of training for reservists. The period of twenty-eight days laid down as the maximum in the old Act is too short in these technical days. The third and last amendment in the law refers to the terms of service in the Royal Fleet Reserve.

"CONWAY" COMMAND.—The appointment was announced in February, in succession to Captain H. W. Broadbent, R.D., R.N.R., as Captain-Superintendent of the mercantile cadets' training ship "Conway" in the Mersey, of Lieutenant-Commander F. A. Richardson, D.S.C., R.N., whose retirement at his own request, with the rank of Commander, took effect on 15th February. Commander Richardson joined the "Conway" as a cadet in 1900, and passing out in 1902, served under sail until 1906, when he went into steam. He became a midshipman, R.N.R., in 1902, and a sub-lieutenant in 1910, but in April, 1913, transferred to the Royal Navy as a supplementary lieutenant. He was decorated for service in torpedo craft in action with enemy submarines, and had commanded other torpedo craft since the war.

"THE FUTURE OF THE ROYAL NAVAL RESERVE."—A lecture on this subject was delivered in the theatre of the Institution on 23rd March, by Captain Sir David Wilson-Barker, R.D., R.N.R. Vice-Admiral Sir Lewis Clinton-Baker, K.C.B., K.C.V.O., C.B.E., Admiral Commanding Reserves, was in the chair. The lecture and discussion will be published in due course in the JOURNAL.

ROYAL NAVAL VOLUNTEER RESERVE.

ROYAL TOUR.—Thirteen ratings R.N.V.R. embarked in H.M.S. "Renown" for the tour of T.R.H. The Duke and Duchess of York to Australia.

BOXING.—All R.N.V.R. Divisions have held eliminating contests during the past three months to determine the teams to represent them in the Inter-Divisional Boxing Competitions, held at Edinburgh, on Saturday, 19th March, which resulted in the Clyde and East Scottish Divisions, R.N.V.R., obtaining a tie for first place and becoming joint holders of the Challenge Cup presented by Commodore His Grace The Duke of Montrose, C.B., C.V.O., V.D., R.N.V.R., for annual competition. The London Division R.N.V.R. secured second place, being only two points behind the winners.

MERSEY DIVISION.—On the 16th February, the old wooden "Eaglet," a converted seventy-four gun frigate and R.N.V.R. Drill Ship for the Headquarters of the Mersey Division, R.N.V.R., from 1911 until 1926, left Salthouse Dock, Liverpool, to be broken up at Mostyn, North Wales. She was launched in 1804, and thus had over 120 years' service to her credit. The "Eaglet" was unfortunately destroyed by fire near Mostyn Quay on 20th April.

ULSTER DIVISION.—On the 21st January, H.M.S. "Caroline" was inspected by the First Lord of the Admiralty and the Prime Minister of Northern Ireland.

On the occasion of the opening of the Northern Ireland Parliament by His Grace The Duke of Abercorn, M.P., on the 15th March, the Ulster Division provided a Guard of Honour.

SUSSEX DIVISION.—The Bruch-Morrison .22 Rifle Competition was carried out during the week commencing 14th February, No. 2 Sub-Division being the winners, obtaining 163 points out of a possible 168.

The Sussex Command Unit Tournament was held at Hove Battery on the 26th February. The Foil, Sabre and Epée competitions were won by members of the Hove Sub-Division and the Bayonet competition by members of the Hastings Sub-Division.

On the 4th February, a team of five men from Nos. 1 and 2 Sub-Divisions competed against the members of the Sussex Sword Club at Brighton. The Sussex Division won the Foil competition by 17 points to 8, the Epée competition being won by the Sussex Sword Club by 6 points to 3.

LONDON DIVISION.—The London Command Unit Tournament was held on board H.M.S. "President" on the 28th February, competitions in Foil, Sabre and Bayonet being carried out.

TYNE DIVISION.—The 5th Annual Boxing Tournament versus the 6th Bn. The Northumberland Fusiliers was held on the 26th February, the Tyne Division securing five wins as against the Fusiliers' three wins. Captain The Hon. M. R. Best, D.S.O., M.V.O., H.M.S. "Nelson," presented the prizes at the termination of the programme.

DOMINION NAVIES.

LAUNCH OF THE "AUSTRALIA."—The new cruiser "Australia" was launched at Clydebank on 17th March. Speaking after the launch, Vice-Admiral Sir Alfred Chatfield, Third Sea Lord, referred to aircraft, and said that although a most formidable and dangerous weapon, if they were to operate overseas they must do so from ships, and be protected by ships, and the protecting ships must be capital

ships. Once this country got it into its head that battleships were of no use the security of the Empire trade and of the Dominions would vanish.

The second new Australian cruiser, the "Canberra," is to be launched by Princess Mary on 31st May.

"MELBOURNE" TO BE SCRAPPED.—A report from Sydney on 9th February, stated that the cruisers "Sydney" and "Melbourne" were to leave for England to be scrapped, their crews being transferred to the new cruisers "Australia" and "Canberra," which are expected to be ready in February and May, 1928, respectively. On 19th March, however, the Premier, Mr. Bruce, announced that the "Sydney" would not be scrapped as had previously been decided, in view of the historic interest attaching to the ship. It was this vessel which fought and destroyed the "Emden" at Keeling, Cocos Island, on 9th November, 1914.

NEW SEAPLANE CARRIER.—The seaplane-carrier now being built at Cockatoo Island for the Australian Navy will be named the "Albatross."

INDIAN NAVY BILL.—The Government of India (Indian Navy) Bill was presented to the House of Commons on 25th February by Earl Winterton, supported by Mr. Bridgeman. The second reading was taken on 9th March. Lord Winterton said the functions of the Indian Navy in peace-time would be the training of personnel for war and the maintenance of services which were required at all times by the Government of India, such as survey and transport work. It would also organize the naval defence of Indian ports. Eventually, the Indian Navy might undertake the patrolling of the Persian Gulf, which was at present carried on by the Royal Navy. The new Bill came before a Standing Committee of the House of Commons on 22nd March, and after minor amendments was ordered to be reported to the House for third reading. This was taken on 5th April.

FOREIGN NAVIES

CHILE.

DESTROYER CONTRACT.—It was reported from Valparaiso on 19th March that the Chilean Naval Council had approved plans presented by Messrs. Thornycroft & Co., Ltd., of Southampton, for the construction of six large destroyers. The firm submitted tenders in competition with a score of other firms in Europe and America. Their designs provide for vessels of 1,320 tons, 280 feet long, and with a speed of 35 knots.

FINLAND.

NEW SUBMARINES.—Writing on 28th January, *The Times* correspondent at Helsingfors stated that the Ministry of Defence had been authorised by the Cabinet to contract with the Crichton-Vulcan firm, of Abo, for the building of two submarines, which would complete the programme of three such vessels initiated in 1925. The contract for the first submarine was made in September last. The vessels will have a surface displacement of 450 tons. The Crichton-Vulcan is the oldest shipbuilding firm in Finland, having been founded in 1737.

FRANCE.

SQUADRON TO VISIT PORTSMOUTH.—The French Government has accepted an invitation for a squadron to visit Portsmouth this year, in return for the visit of a British squadron to Brest, after the war. The squadron will consist of the

three "Duguay Trouin" class cruisers, three new flotilla leaders and three new destroyers, and will be under the command of Rear-Admiral Pirot, flying his flag in the "Lamotte-Picquet." It will arrive at Portsmouth on Monday, 30th May, and leave again on Saturday, 4th June.

RECRUITING CHANGES.—A Bill modifying the conditions of enlistment in the French Navy was laid before the Chamber early in February by M. Georges Leygues, Minister of Marine. The Bill seeks to increase the supply of men, which for some time has been inadequate. Under the *Inscrits Maritimes*, dating back to 1683, and owing its origin to M. Colbert, the famous Minister of Marine under Louis XIV, every man following a maritime occupation of any kind is registered. The liability for comparatively long naval service has discouraged men from adopting a sea occupation. The new Bill provides for the reduction of the maximum of active service from five to three years, followed by two years' special liability.

FLYING AND SUBMARINE EXPERIENCE FOR NAVAL CADETS.—During her present cruise, the Cadets' training ship, "Jeanne d'Arc" is carrying a seaplane on board and the Cadets are taken up for flights at the various ports of call. It has also been arranged for them to gain experience in submarine work by going out for dives in the 3rd Escadrille at Toulon.

A SUBMARINE AEROPLANE.—On 1st February, what was claimed to be the first two-seater aeroplane built to be carried on board a submarine flew from Meulan-on-Seine, where it was built, to Suresnes, for despatch to Brest, where it will be tried by the French Naval Air Service. The machine is driven by a Salmson engine of 120 horse-power, and the wings fold back, enabling it to be quickly enclosed in a water-tight cylinder when the submarine dives.

CONSTRUCTION PROGRESS.—The "Pluton," cruiser-minelayer, of 5,560 tons, has been laid down at Lorient. The "Caiman," submarine, the last of the three 1,129-ton vessels laid down in 1924 (the others being the "Phoque" and the "Espadon") was launched at Cherbourg early in March. The large destroyer "l'Adroit," laid down in 1925, was launched at Dunkirk on 6th April. With the completion of the "Primaguet," the first squadron of three post-war cruisers is in service, the others being the "Duguay-Trouin" and "Lamotte-Picquet," each of 7,873 tons, eight 6.1-in. guns, and 34 knots speed. The flotilla leader "Leopard" attained a speed of 35 knots on a full power trial.

GERMANY.

NAVY ESTIMATES.—The increase of about £1,000,000 in this year's German Naval Estimates is being much criticised by the Socialist Deputies and Press. The estimates of recurring and non-recurring expenditure amount to 223.3 million marks (over £11,000,000), as compared with 198.1 millions (about £10,000,000) last year, and only 104.2 millions in 1924. In 1914, with a fleet about ten times as large, the expenditure was 476 million marks, equivalent in present-day values to about 600 millions. The personnel totals 4,979 officers and 9,935 men. The former includes 12 Admirals, Vice-Admirals and Rear-Admirals, and 147 Captains and Commanders.

A NAVAL TRAINING SCHOOL AT POTSDAM.—In the course of a long article on the Naval Estimates by Captain L. Persius (retired), the following reference is made to a Naval training school at Potsdam :—

When the attention of the Defence Minister is drawn by members of the House to any state of affairs on which it is feared that the taxpayers' money

is being improperly used, Dr. Gessler makes the stereotyped reply: "I know nothing about it." On 6th March, 1926, a member made the following statement before the House: "There is a sailors' school in Potsdam which is supposed to be of a private character. The pupils of this school are understood to be prepared for service in the Navy, and, as is unnecessary to add, are educated in the 'spirit of Potsdam.' Can the Minister say whether pupils of this school have been taken into the Navy?" Whereupon Dr. Gessler replied: "I have no information on the subject, and I do not know the school." To this one might reply: Dr. Gessler has at his disposal an official motor car. He often travels to Potsdam. Has he never seen the innumerable pupils of the school in question, who wear uniforms which correspond exactly to those of the German Navy; has he never noticed the exercises which are carried out on the Havel in dozens of steamers and rowing boats under the leadership of officers, warrant officers, etc.? And it may also be asked: Is there anybody who will believe that this expensive institution can be provided out of private means?

NEW SHIPBUILDING.—Following the completion of the new "Emden," now engaged on a prolonged cruise, and recently visiting ports in African and Indian waters, a similar 6,000-ton cruiser, the "Karlsruhe," is in hand; and two more, provisionally known as "C" and "D", were laid down in 1926, while a fifth is projected. The first post-war German destroyer, the "Möwe," was completed recently, a vessel of 785 tons, with three 4.1-in. guns and four torpedo tubes, and a speed of 32 knots. Twelve destroyers are building, of which the first five were launched in 1926 and named the "Seeadler," "Greif," "Albatross," "Condor" and "Falke."

"KÖNIGSBERG" LAUNCHED.—Cruiser "C" was launched at Wilhelmshaven on 26th March, and named the "Königsberg," by the wife of Vice-Admiral Loof, who was in command of the first "Königsberg" when she was destroyed in the Rufigi River, East Africa, in 1915. The "Königsberg" is of the same general type as the "Emden," but slightly larger, her dimensions being: length, 174 metres; breadth, 15.2 metres; and draught, 5.42 metres; displacement, 6,000 tons; the main armament is 9.15 centimetre guns (as compared with 8.0 centimetre in the "Emden"); speed, 32 knots (as compared with 29).

BATTLESHIPS OR 10,000-TON CRUISERS.—With reference to the article published in these Notes for February last, the following further article in regard to new construction has appeared in the German Press: "It is laid down by the Treaty of Versailles that the displacement of battleships of the German Navy may not exceed 10,000 tons. The German Naval constructors are therefore faced with the task of producing an armoured ship of 10,000 tons which will satisfy modern requirements. The armament and armour must be brought into accord with the speed; accommodation must be provided for a crew of at least 500 men, and the ship must be satisfactory for carrying out foreign cruises.

Heavy turbine and piston engines, which consume so much fuel, do not come into consideration. The new German armoured ships must be fitted with heavy oil engines. These engines free the ship of the funnels which take up so much room and offer a target for enemy fire, and can be built deeper in the ship, thus affording better protection. The speeds obtainable with these engines are quite satisfactory. There are at the present time vessels fitted with these engines which have a speed of over 20 sea-miles. A distance of 2,500 sea-miles at cruising speed is quite sufficient. There were formerly ships of this size in the "Brandenburg"

class, which had a radius of action of 4,500 miles with 1,050 tons of coal at a speed of 10 knots. For 2,500 miles at a speed of 12 knots a supply of 500 tons should suffice. Even with a supply of 750 tons of fuel the performances of the "Brandenburg" would be far exceeded.

The calibre of the guns for the new vessels is not limited. It can therefore be supposed that the old 11-in. gun at present in use in the German Navy will be succeeded by a more modern gun. The foreign navies have agreed on the 16-in. gun as the heaviest armament, and there is no reason why Germany should remain under this calibre. The only question is, how many guns of this calibre can be mounted on a ship of 10,000 tons? The triple turret has not proved itself, in the eyes of the American Navy, so satisfactory as to lead them to repeat this type. The twin turret is, and remains, the ideal system of grouping together of heavy guns. If the secondary armament—formerly much used in the German Navy—is completely renounced, the mounting of four twin turrets would not be out of the realms of possibility. Two turrets fore and aft, allowing of a bow and stern fire from four guns and a broadside fire from eight guns, would be ideal. Four twin turrets with armour and ammunition would, however, prove to be a very heavy weight, and it is therefore questionable whether a sufficient margin would remain over for heavy oil motors to allow of a speed of 20 sea-miles. With three two-gun turrets, either the bow or the stern fire is weakened, and only two turrets would not make a strong impression, even on the possible Baltic opponents of the German Navy. No great reduction in weight would accrue by reducing the calibre of the armament to 14-in., and although an appreciable difference would result with 12-in. guns, this would necessitate a great reduction in the fighting strength.

If fast armoured cruisers were built in place of battleships, there would be other possibilities open to the constructors. It would then be possible to build ships resembling the English "Raleigh" class, and by renouncing the speed of 30 sea-miles these ships could be given a water-line armour protection against torpedoes. The torpedo armament would have to be neglected, as the requirements of above-water tubes on high-decked ships of this type are almost impossible to meet. Only the absolutely vital parts of the ship would be armoured, i.e., amidships, armament, wireless equipment and the decks.

The modern German 10,000-ton ship will have a strange appearance. With a through main deck (*durchlaufendem Hauptdeck*); no funnels; a thick fighting mast and a thin wireless mast; no projections for defence armament, but probably combined anti-aircraft gun stands; a probable length of nearly 200 metres, a corresponding breadth, and not too great draught; the ship would in every way remind one more of a cruiser than a battleship. Little can be said regarding the cost; it would hardly be possible to build an armoured ship of this tonnage to-day under £1,750,000."

GREECE.

NEW CONSTRUCTION.—The training ship "Ares," building in France for the Greek Government, was launched at Toulon on 28th January.

The armoured cruiser "Averoff," which has been undergoing a long refit at Toulon will, it is reported, shortly be ready for trials.

HOLLAND.

SUBMARINE'S ADVENTURE.—On 3rd March, a submarine of the Netherlands Flotilla had a curious experience when submerged in the Scheldt between West Kapelle and Zouteland. Entering a whirlpool at a depth of about 100 feet, the vessel began to gyrate, and continued to do so for an hour, the control appliances being apparently defective. Coming to the surface, she was still not under proper control, and a British steamer sent a wireless request for help to Flushing, when three tugs came to the submarine's assistance.

ITALY.

NAVY ESTIMATES.—On 26th March, the Italian Chamber of Deputies approved the Navy Estimates for 1927-28, when Admiral Sitianni, Under-Secretary of State, said that since last year the funds allocated to naval reconstruction had been increased by 160 million lire (about £1,500,000). The Government is thus enabled to pass "a modest programme of submarines and torpedo craft."

NEW CONSTRUCTION.—The submarine "Balilla" was launched at Ansaldo's yard, Spezia, on 20th February.

JAPAN.

REPLACEMENT PROGRAMME.—A replacement programme which has been approved by the Cabinet, and is being brought before the Diet for consideration, projects the construction between 1927-28 and 1931-32 of the following vessels additional to those of the programme already approved, viz.: 4 cruisers, 15 destroyers, 4 submarines, 2 river gunboats, 1 aircraft-carrier and 1 minelayer.

LAUNCH OF THE "MYOKO."—The new Japanese 10,000-ton cruiser "Myoko" was launched on 16th April at Yokosuka in the presence of the Emperor of Japan and a number of high officials. The Emperor was accompanied by Count Chinda, the Lord Chamberlain, military and naval officers, and Princes and Princesses. This was his first appearance at a public function since his accession.

PERU.

NEW SUBMARINES.—The contract for the construction of two additional submarines by the Electric Boat Company, U.S.A., has been signed. The submarines are to be laid down in March to May this year, and completed in November, 1928; these two submarines will complete the six already decided on.

SUMMER CRUISE.—It is reported in the Peruvian Press that a cruise of 5,600 miles, lasting eighty-one days, is to be undertaken in the summer by the cruisers "Grau" and "Bolognesi" and submarines "R.1" and "R.2." The opportunity will be taken to give submarine training to Naval Cadets.

SWEDEN.

The question as to the future of the Swedish armed forces has been a live political issue for six years. Various proposals had been put forward, modified and rejected, until 1925, when a Defence Act was passed. The effect of this Act was to reduce largely the Army, and to amalgamate the Naval and Military Flying Corps into a separate Air Force, but, except to alter the conditions of service of

the personnel and to reduce the number of ships in commission through reduction of personnel little change was made in the Navy. This was not so much that no plans for the reorganization and replacement of ships were brought forward, but that agreement could not be found between the Naval Staff and the various political parties. In order, therefore, to pass the Defence Act and thus obtain financial relief, the replacement programme for the fleet was omitted, though the composition of the fleet was specified. A committee, composed of experts and politicians, was also set up to examine the problem and after eighteen months' work they have unanimously submitted a lengthy report, a result which has caused some surprise and wide satisfaction, though in matters of detail the Conservatives would prefer a stronger Navy and the Socialists would prefer less. The Communist party are, as is to be expected, vociferous in their denunciation of the report, alleging that a threat to Soviet Russia is apparent. Such is the political situation, however, that neither principal party can make much tactical use of their desires. It is stated that the Chief of the Swedish Naval Staff has nothing to say against the conclusions arrived at, and it is expected that the report will receive parliamentary sanction. The Swedish Navy will then be able to face the future with a settled policy.

A very brief summary of the report is given below. It is clear that considerable pains have been taken to propose measures giving maximum value for expenditure of money, economy in defensive measures being of considerable importance.

SUMMARY OF REPORT OF NAVAL COMMITTEE.

STRATEGY.—Naval defence must not be based on the protection of certain local areas along the coast. Neutrality must be preserved by a considerable number of seaworthy patrol vessels which, in the event of a determined effort at a breach of Swedish neutrality, need the backing of a powerful mobile force. Both these considerations require an efficient sea-going fleet, which in the report is referred to, somewhat anomalously, as the "Coastal Fleet."

COMPARISON OF WARSHIP TYPES.—Units of the "Sverige" type of coast defence vessels are recommended as the backbone of this fleet. A modern battleship type is out of the question, if only for financial reasons, while an armoured cruiser of the same cost as a "Sverige" would possess insufficient fighting qualities. The type visualised, costing about £1,500,000 sterling, could embody the following characteristics, the corresponding figures for "Sverige" class being appended for comparison:—

<i>New Type C.D.V.</i>	<i>"Sverige" Class.</i>
Displacement, 7,650 tons	7,500 tons.
Speed, 24 knots	23 knots.
Armament—	
Four 11-in. guns	Four 11-in.
Six 5.9-in. guns.	Eight 5.9-in.
Four 3-in. guns, A.A.	Six 3-in.
Two 2-pdr. automatic guns, A.A.	Two 6-pdr.
No torpedo armament	Two 18-in. tubes.
Armour, protection superior to "Sverige."	
Fuel	Coal and oil.

A ship of this type would be superior to any belligerent cruiser and could not be attacked by battleships with impunity.

Cruisers.—Cruisers are not essential for Swedish naval strategy, extended reconnaissance being effected by aircraft and destroyers.

Destroyers.—Since the destroyers will have no cruisers to provide support, they must be equal in fighting strength to any similar enemy vessels. It is claimed that the two units of the "Nordenskjold" class, now under construction, conform to these requirements, and future construction should be similar.

Vedette Boats.—As the number of destroyers must be limited on account of cost, vedette boats should be provided for anti-submarine work, minelaying and minesweeping. Their suggested features are: displacement, 200 tons; speed, 27 knots; Armament, two 3-in. guns, two machine guns; mines.

Hangar Cruiser.—To facilitate aircraft co-operation in fleet operations a new type of vessel termed "Hangar Cruiser" is recommended. She would carry aircraft capable of being catapulted, but they would be unable to land on her deck. The design proposed would include—

Displacement, 4,500 tons.

Speed, 27 knots.

Aircraft, 12.

Catapults, 2.

Armament—

Mines.

Six 6-in. guns.

Four 3-in. guns, A.A.

Eight 2-pdr. automatic guns, A.A.

It will be noticed that she will combine duties of aircraft carrier and minelayer.

Submarines.—While the Committee do not consider that the battleship, as represented by the coast defence vessels, is doomed, they are emphatic that submarines are necessary. They recommend two types:—

Type "A".—Similar to "Draken," now under construction, of comparatively high surface speed for working in conjunction with the fleet, and whose principal weapon is the torpedo.

Type "B".—A torpedo and minelaying type, cheaper than type "A" (presumably of lower speed) and carrying both mines and torpedoes. (This type is represented by "Valen," completed in 1925).

COMPOSITION OF THE COASTAL FLEET.—The Committee recommend that the Coastal Fleet should consist of:—

4 Coast defence vessels.

8 Destroyers.

8 Vedette boats.

3 Submarines, Type "A" (1 division).

6 Submarines, Type "B" (2 divisions).

1 Hangar cruiser.

NEW CONSTRUCTION.—It is proposed that the Coastal Fleet should be brought up to the recommended strength by 1938 and a programme in two parts is put forward:—

Type.	To be built between	
	1927-32	1933-38
Coast defence vessels	—	1
Destroyers	2	2
Vedette boats	4	4
Submarines, Type "A"	1	—
Submarines, Type "B"	2	4
Hangar cruisers	1	—

UNITED STATES.

NEW CONSTRUCTION.—On 24th February, the House of Representatives by 208 to 172 votes declared in favour of an appropriation of 450,000 dollars to begin work on the three remaining cruisers of the 1924 programme, and a few days later President Coolidge signed the Bill. The House had previously voted down this appropriation, but the Senate had adopted it, and after the latter body had overwhelmingly re-instructed its confrères to adhere to this decision, the House of Representatives agreed to reverse its previous decision. The Bill, however, contains a provision empowering the President to stop this work if a disarmament conference is held.

EARLIER SHIPS ORDERED.—Tenders for the construction of three other ships of the 1924 programme, known provisionally as Nos. 26, 27 and 28, were opened at the Navy Department on 10th March. The 1924 programme included eight cruisers, of which the first two, the "Pensacola" and "Salt Lake City" were laid down in 1926. Then come the three now being tendered for; and lastly the three, mentioned above, for which credits have just been voted. A further programme of ten cruisers, as mentioned in the last JOURNAL, is projected, but not yet authorised.

MODERNIZATION OF BATTLESHIPS.—A Bill for the modernization of the battleships "Oklahoma" and "Nevada" has been signed by the President, but no funds have yet been voted for the work.

PERSONNEL STRENGTH.—The personnel strength in enlisted men is to be 83,250. According to the *Army and Navy Journal*, Washington, with an enlisted strength on 21st February of 83,760, the Bureau of Navigation is slowing down recruiting so that it may start the new fiscal year with approximately the strength authorised. Orders were issued stopping the competition between recruiting stations, raising the minimum age for enlistment, from 17 to 18 years, and calling for strict adherence to physical standards, with a minimum height of 64 inches. The strength had risen from 82,814 on 31st January and 81,384 on 21st December.

NAVY YARD FIRE.—A big fire occurred in Brooklyn Navy Yard on 9th February, destroying three wooden storehouses and causing damage estimated at about £300,000. The main storehouse, which was destroyed, contained half-a-dozen anti-aircraft guns and large stocks of equipment.

ARMY NOTES

HOME.

EXTRACTS FROM THE MEMORANDUM OF THE SECRETARY OF STATE FOR WAR, RELATING TO THE ARMY ESTIMATES FOR 1927.

The Estimates for the Army for the year 1927 stand at a total of £41,565,000. The comparative figures for recent years are :—

Year.	Effective charges.	Non-effective charges.	War terminal charges.	Total.
	£	£	£	£
1925	36,248,300	7,866,100	385,600	44,500,000
1926	34,462,500	7,923,000	114,500	42,500,000
1927	33,341,200	7,997,000	226,800	41,565,000

They include no provision for any expenditure in connection with the Shanghai Defence Force.

ESTABLISHMENT AND DISTRIBUTION OF THE REGULAR ARMY.—The total of Vote A for 1927 is 166,500, as compared with 159,400 for 1926, an increase of 7,100, but the figures include 2,000 Indian troops, as against 3,600 for 1926, employed by the Air Ministry in Iraq. The net addition of 8,700 in the War Office sphere is due to (a) the transfer during 1927 of responsibility for the garrison of Aden from the Indian to the Imperial Government, the numbers involved being 2,785, and (b) the despatch of the Shanghai Defence Force, in respect of which a temporary addition of 10,000 has been made to Vote A to cover the troops sent from India, etc.

The reduction in the War Office sphere would otherwise have been approximately 4,000, due mainly to a re-organization of the Cavalry, the Royal Artillery and the Royal Corps of Signals, to a reduction of the Royal Army Ordnance Corps, to the disbandment of the West India Regiment, and to further small economies.

The following changes in organization are to be made in 1927 :—

Cavalry.—During the past year the Cavalry requirements of the Army have been under consideration. The measures decided upon include : (i) the abolition of the Cavalry Depot and the concentration of the training of recruits in regiments ; (ii) the reduction of one squadron in each of the twelve regiments at home ; (iii) the mechanization of the First Line Transport of the Cavalry by certain stages.

The net effect of these proposals is a reduction of 47 officers, 1,294 other ranks and 1,445 horses in the twelve regiments at home.

Royal Artillery.—Five Heavy Batteries at home are to be converted into Medium Batteries, and, with the three unbrigaded Medium Batteries at home, will be organized into two Medium Brigades. This makes, with the three Brigades

in existence, a total of five Medium Brigades on the British establishment. Three Heavy Batteries at home are to be converted into Anti-Aircraft Batteries and formed into a Second Anti-Aircraft Brigade. Four Heavy Batteries at home are to be organized into a mobile Heavy Brigade. Mechanized Pack Artillery Brigades at home are to be converted to a light draught basis.

The effect on Royal Artillery establishments of the above proposals is a reduction of 1,105 all ranks, or, after including the addition of the personnel at Aden (226 all ranks), a net decrease on Vote A 1926 of 18 officers and 861 other ranks.

Royal Engineers.—It has been decided to withdraw the personnel of the Fortress Company, Royal Engineers, in the Channel Islands.

Royal Corps of Signals.—The partial mechanization of certain signal units is to be carried out, and this with other changes results in a saving of 2 officers and 78 other ranks.

STRENGTH AND RECRUITING.—At the beginning of the financial year the strength of the British Army, inclusive of the British troops in India, should approximate to the establishment.

As the outflow, however, will be abnormal in 1929, 2,000 men serving overseas, and due to go in that year, will be invited to transfer prematurely to the Army Reserve during the coming year.

Recruiting for the Regular Army during the past year has not been so good as in 1925, but in view of the industrial unsettlement may be regarded as satisfactory; the total number of enlistments, which will fall not far short of the total of 31,000 required, is again about one-third of the number of candidates, viz., 35 per cent., as compared with 36 per cent. last year.

The reduction in pay which came into operation in October, 1925, was followed by a marked decrease in the intake during each of the succeeding three months, but the number of applicants improved later and the effect of the reduction appears largely to have spent its force. The General Strike, too, in May resulted in an immediate fall of about 25 per cent. below normal, and although this fall was of temporary duration, the subsequent unemployment had no especially favourable effect on recruiting. This confirms what is now the normal experience that the better the state of employment the better is the intake of recruits.

The low proportion of men finally accepted is still due mainly to the high physical standard required of a recruit, and no less than 58 per cent. were rejected on medical and physical grounds.

Under the short service system only a small proportion of enlisted men can make their life's career in the Service, and the problem of re-settlement in civil life of the remainder on their discharge or transfer to the reserve is one that still awaits a satisfactory solution. Every year from 28,000 to 30,000 men pass from the Army, mainly in the prime of life, and of these about 20,000 are unskilled.

The numbers of soldiers who can be taught a trade which will be of use to them in civil life are limited. During the last year 1,050 men passed through the Army Vocational Training Centres at Catterick and Hounslow. Of these, 850 went to employment. In addition, about 1,000 men have been trained at Command Vocational Training Classes and 102 men specially trained at Catterick have proceeded overseas during the past year to settle on the land. It is hoped that the facilities for this form of Vocational Training at home may be increased, and the

question of giving somewhat similar training in India with a view to the direct migration of soldiers from that country to Australia on the conclusion of their Colour Service is now under consideration. Arrangements are in hand for increasing the flow of suitable candidates to the Dominions.

The number of posts under Government, suitable for the ex-regular soldier, is limited, and whatever the War Office and other Government Departments can do towards finding him employment, it is still necessary to rely on the public spirit of local bodies and private employers generally throughout the country for the employment of the great majority of the men who leave the Colours every year. It must be done on a far more extensive scale before the intending recruit can be offered the inducement of assured employment when he leaves the Colours. Most of the men who leave the Colours to-day are men of intelligence, trustworthy character and fair education. During the last year 2,289 obtained a First Class Certificate of Education, and 92 a Special Certificate (equivalent to and accepted as the matriculation standard in most Universities).

The Boys' Technical School at Chepstow reached during the year its full establishment of 990, and the first batch of boys on completing their training, have been posted to their respective corps.

ARMY AND SUPPLEMENTARY RESERVES.—The total strength of the Army Reserve on 1st April next will be about 92,000, a decrease of some 7,000 during the past year; this is due to a large number of Section "D" Reservists leaving the Reserve on the expiration of their engagements. During the coming year an increase of nearly 4,000 is anticipated. From 1928 onwards the strength of the Reserve should grow rapidly.

TERRITORIAL ARMY.—The strength of the Territorial Army (exclusive of Permanent Staff) on 1st January, 1927, was 6,760 officers and 139,762 other ranks, an increase of 159 officers and 1,187 other ranks, as compared with 1st January, 1926. Recruiting progressed well in the early months of 1926, but received a set back as the result of the industrial troubles of the summer and the consequent cancellation of the annual camp of a large number of units.

The strength of the Cadet Force on 31st October last was 2,361 officers and 46,428 other ranks. The numbers who attended camp in 1926 were 1,073 officers and 17,019 other ranks. The numbers of cadets and ex-cadets who are known to have joined His Majesty's Forces within six months of leaving the Cadet Force during the year ended 31st October last is 2,147. This figure does not include ex-cadets who join after having left the Cadet Force for six months, and of whom a record cannot be kept.

HEALTH OF THE ARMY.—The health of the Army throughout the year has continued to be very satisfactory, although, like the civilian population, the troops have suffered somewhat severely from influenza, which was, however, of a mild type, necessitating but a few days in hospital. There has been no undue incidence of any other infectious disease.

OFFICERS' TRAINING CORPS.—The establishment of the Junior Division of the Officers' Training Corps could be largely increased if financial consideration permitted, and encouraging features have been the growing number of ex-cadets taking commissions in the Territorial Army, and the marked improvement in the number of schoolmasters taking commissions within the corps itself.

The strength of the Senior Division has increased considerably since last year. It is not sufficiently known that the Senior Division, Officers' Training Corps, will

provide the only machinery for the training of officers for the Territorial Army in case of a national emergency, and that no individuals in the event of such an emergency will be entitled to commissions in the Territorial Army without further training, unless they are already in possession of the Officers' Training Corps Certificate "A". Some 3,500 of the Senior and Junior Divisions qualify for this certificate annually.

TRAINING AND EDUCATION.—Owing to the industrial situation, the training of the Army in 1926 had to be curtailed, but, notwithstanding unavoidable interruptions, collective training of nearly all units was carried out. Six infantry brigades did useful brigade training in co-operation with other arms, and the 1st and 2nd Divisions trained as divisions so far as their limited facilities would permit.

In the coming season training will be carried out under command arrangements, culminating in inter-divisional training for Aldershot Command troops, and divisional training for the troops of the Eastern and Southern Commands. It will be necessary to put the Manœuvres Act into force in South Oxfordshire for the 1st and 2nd Divisions and in East Kent for the 4th Division. By the exercise of stringent economy it is hoped to carry out this considerable programme at a cost of £130,000 only, as compared with a grant for training which exceeded £200,000 before the war.

The policy of admitting non-commissioned officers from the ranks as cadets to the Royal Military College has now been extended to the Royal Military Academy. The conditions are the same with the exception of an additional test in mathematics and physics. Since the introduction of this scheme of "Y" Cadets, 109 have passed through the Royal Military College, Sandhurst, and been given commissions, and at the last passing-out examination, seven out of the first twelve places were gained by "Y" Cadets.

The syllabus of instruction at Sandhurst and Woolwich has been changed with the object of giving the Cadet a more general education and of deferring some of the more technical training to a later stage in his military career.

MECHANIZATION.—Steady progress has been made in the experimental work of mechanization and arrangements have been made to assemble in the Salisbury Plain area an Experimental Mechanical Force, composed of entirely mechanized units of Artillery, Engineers, Signals, Infantry and the Tank Corps, whose primary function will be to study the tactical employment and the organization of a highly mobile force of this nature.

It has been decided to mechanize all Regular Medium Artillery, and a suitable type of dragon has been evolved. With regard to Field Artillery, two brigades have been experimentally equipped with mechanical vehicles of various kinds, but before a type of tractor is finally adopted, further trial and experiment will be necessary. For the present, the mechanization of a proportion only of the Field Artillery is contemplated.

A start is being made with the mechanization of the Cavalry by providing six regiments with cross-country mechanical vehicles, in place of horsed vehicles, for normal first line transport work and for the carriage of a proportion of their machine guns and crews. At the same time endeavour is being made to evolve a reliable cross-country armoured car, with a view to the possible introduction of such a vehicle, if and when it is obtained, into the ranks of the Cavalry.

It is hoped that the Dominions may consider the possibility of adopting in their respective military forces the means of mechanization which have been found

by experiment and trial at home to be most fitted for the requirements of our Army organization.

ARMAMENTS AND RESEARCH.—To meet the requirements of modern war it is felt that the fire-power of the Cavalry and Infantry ought to be increased. It has therefore been decided to raise the number of machine guns allowed in war for a Cavalry regiment and an Infantry battalion from eight to twelve. For the same reason the question of adopting a self-loading rifle, if a satisfactory weapon of this type can be obtained, or, alternatively, of introducing a more serviceable light automatic to replace the Lewis and Hotchkiss guns with which the Cavalry and Infantry are now equipped, is receiving consideration.

Artillery equipment generally is being improved by the adoption of new designs, and a great advance has been made in the past year in anti-aircraft practice as a result of the provision of more accurate and up-to-date instruments.

Anti-gas defence has been pursued with vigour, and problems connected with collective protection as well as individual protection are being carefully studied. A new and greatly improved pattern of respirator has been issued to a large proportion of our troops.

APPOINTMENTS AND PROMOTIONS.—His Majesty the King has been graciously pleased to approve the following appointments :—General Sir Walter P. Braithwaite, K.C.B., to be A.D.C. General to the King, with effect from the 1st March, 1927, in succession to General Sir Walter N. Congreve, V.C., K.C.B., M.V.O., A.D.C. General, Colonel Commandant the Rifle Brigade (Prince Consort's Own), deceased. Colonel E. Treffry, C.M.G., O.B.E., T.D., Territorial Army, to be Additional Aide-de-Camp to the King, in succession to Colonel W. H. A. Wharton, C.B.E., V.D., T.D., Territorial Army. Lieutenant-Colonel and Brevet Colonel J. A. Hartigan, C.M.G., D.S.O., M.B., R.A.M.C., as Honorary Physician to the King, vice Major-General O. L. Robinson, C.B., C.M.G., late R.A.M.C., retired.

Field Marshal Sir Claud Jacob, G.C.B., K.C.S.I., K.C.M.G., to be Colonel of the Worcestershire Regiment, in succession to General Sir George Higginson, G.C.B., G.C.V.O., deceased. Lieutenant-General Sir Herbert C. C. Uniacke, K.C.B., K.C.M.G., to be Colonel Commandant, Royal Regiment of Artillery, vice Major-General Sir John Leach, K.C.V.O., retired pay, deceased. Lieutenant-General Sir George F. Gorringe, K.C.B., K.C.M.G., D.S.O., retired pay, to be Colonel Commandant, Corps of Royal Engineers, vice General Sir Charles Warren, G.C.M.G., K.C.B., retired pay, deceased. Lieutenant-General Sir Gerald F. Ellison, K.C.B., K.C.M.G., retired pay, to be Colonel, The Loyal Regiment (North Lancashire), vice General Sir James Willcocks, G.C.B., G.C.M.G., K.C.S.I., D.S.O., retired pay, deceased. Major-General Sir Victor A. Couper, K.C.B., to be Colonel Commandant, 1st Battalion, The Rifle Brigade (Prince Consort's Own), in succession to General Sir Walter N. Congreve, V.C., K.C.B., M.V.O., A.D.C. General, deceased. Colonel (temporary Colonel Commandant) C. P. Deedes, C.B., C.M.G., D.S.O., as Colonel of The King's Own Yorkshire Light Infantry, with effect from the 10th March, 1927, in succession to General Sir Arthur S. Wynne, G.C.B., retired pay.

The following promotions have been approved :—Lieutenant-General Sir Charles H. Harington, G.B.E., K.C.B., D.S.O., D.C.L., to be General in succession to General Sir Walter Congreve, V.C., K.C.B., M.V.O.; Major-General Sir W. Hastings Anderson, K.C.B., to be Lieutenant-General; Colonel C. W. Scott, C.M.G., C.B.E., D.S.O.; Colonel H. W. Newcome, C.B., C.M.G., D.S.O.; and Colonel H. W. Higginson, C.B., D.S.O., A.D.C., to be Major-Generals.

The undermentioned promotions will be carried out during the next few months :—Lieutenant-General Sir William E. Peyton, K.C.B., K.C.V.O., D.S.O., to be General ; Lieutenant-General Sir George M. Kirkpatrick, K.C.B., K.C.S.I., to be General ; Major-General Sir Percy P. de B. Radcliffe, K.C.M.G., C.B., D.S.O., to be Lieutenant-General.

The following appointments are announced by the War Office :—

Major-General J. C. Harding-Newman, C.B., C.M.G., to be Major-General in Charge of Administration, Aldershot Command, in succession to Major-General Sir P. C. Hambro, K.B.E., C.B., C.M.G. ; Major-General A. B. E. Cator, C.B., D.S.O., to be General Officer Commanding Sind-Rajputana District, India ; Major-General Cyril N. Macmullen, C.B., C.M.G., C.I.E., D.S.O., Deputy Quarter-master-General in India, to succeed Major-General Sir Louis Vaughan in Command of the Rawalpindi District ; Lieutenant-General Sir L. J. Bols, K.C.B., K.C.M.G., D.S.O., to be Commander-in-Chief, Bermuda, in succession to General Sir J. J. Asser, K.C.B., K.C.M.G., K.C.V.O. ; Major-General W. H. Bartholomew, C.B., C.M.G., D.S.O., to be Director of Recruiting and Organization, War Office, in succession to Colonel Sir R. S. May, K.B.E., C.B., C.M.G., D.S.O. ; Major-General P. G. Grant, C.B., C.M.G., to be Director of Fortifications and Works, War Office, in succession to Major-General H. F. Thuillier, C.B., C.M.G. ; Major-General A. A. McHardy, C.B., C.M.G., D.S.O., to be Major-General in Charge of Administration, Southern Command, in succession to Major-General G. H. B. Freeth, C.B., C.M.G., D.S.O. ; Major-General G. Walker, C.B., C.B.E., D.S.O., to be Commandant of the School of Military Engineering and Inspector of Royal Engineers, in succession to Major-General P. G. Grant, C.B., C.M.G., appointed Director of Fortifications and Works, War Office ; Major-General A. Solly-Flood, C.B., C.M.G., D.S.O., to be Deputy Adjutant-General, Army Headquarters, India ; General Sir John P. Du Cane, K.C.B., Colonel Commandant Royal Artillery, A.D.C. General, to be Governor and Commander-in-Chief of Malta, in succession to General Sir Walter Congreve, V.C., K.C.B., M.V.O., A.D.C. General, deceased ; Lieutenant-General Sir W. Thwaites, K.C.B., K.C.M.G., to be General Officer Commanding-in-Chief, The British Army of the Rhine, in succession to General Sir J. P. Du Cane, K.C.B., A.D.C. General ; Lieutenant-General Sir R. B. Stephens, K.C.B., C.M.G., to be Director-General of the Territorial Army in succession to Lieutenant-General Sir H. S. Jeudwine, K.C.B., K.B.E.

ROYAL ARTILLERY—NOMENCLATURE AND ORGANIZATION.—According to Army Order 164 of 1924, and Army Order 88 of 1927 :—

1. British Pack Brigades and Batteries will be designated Light Brigades and Batteries, Royal Artillery ; (b) Indian Pack Brigades and Batteries will be designated Indian Mountain Brigades and Batteries, Royal Artillery ; (c) The Pack Artillery Training Centre will be designated The Mountain Artillery Training Centre ; (d) The Chitral Pack Artillery Section will be designated the Chitral Mountain Artillery Section ; (e) No. 1 (Hong Kong-Singapore) Pack Battery, Royal Artillery, will be designated No. 1 (Hong Kong-Singapore) Mountain Battery, Royal Artillery.

2. The Indian Pack, or newly styled Mountain, Batteries have been renumbered.

3. A number of Heavy Batteries are to be converted into Medium or Anti-Aircraft Batteries and Brigades (See A.O. 89 of 1927).

TERRITORIAL ARMY.

DISBANDMENT OF UNITS, TERRITORIAL ARMY.—His Majesty the King has approved, with regret, of the disbandment of the undermentioned units of the Territorial Army: The 42nd (2nd Western), 47th (2nd London), 48th (1st Southern), 49th (2nd Northern), 50th (1st Northern), 51st (1st Scottish), 53rd (3rd Western), 56th (1st London) Casualty Clearing Stations, Royal Army Medical Corps; the 47th (2nd London), 52nd (2nd Scottish) Veterinary Hospitals, and the 5th (London), 4th (Scottish) Veterinary Evacuating Stations, Royal Army Veterinary Corps.

REDUCTION OF ESTABLISHMENT.—A reduction of some 30 per cent. in the establishment of the batteries of the 51st (London), 52nd (London), 53rd (City of London), and 54th (City of London) Anti-Aircraft Brigades, Royal Artillery, Territorial Army is announced. This reduction will also affect the new Brigade forming at Tonbridge.

TERRITORIAL ARMY BOUNTY.—In February Army Orders the following amendment to T.A. Regulations, 1924, appeared:—

611 Warrant officers, N.C.O's. and men who were serving in the Territorial Army on 28th February, 1927, will be dealt with for bounty purposes under paras. 612 to 616 during the continuation of their current engagements signed by them not later than 28th February, 1927.

Warrant officers, N.C.O's. and men who enlist into or re-engage in the Territorial Army on or after 1st March, 1927, will not be eligible for any bounty under these paragraphs.

Paragraph 617. *Add at end:* "Boys who enlist into the Territorial Army on or after 1st March, 1927, will not be eligible for bounty."

After the issue of this Order the Secretary of State for War announced in the House of Commons that a proficiency grant of 30s. per head would be made to the Territorial Army in place of the bounty that had been cancelled by the above Order.

THE DOMINION FORCES.

REGIMENTAL ALLIANCES.—His Majesty the King has approved of the following regimental alliances:—

Non-Permanent Active Militia of Canada.—The Canadian Fusiliers (City of London Regiment) to the Royal Fusiliers (City of London Regiment).

Australian Military Forces.—The 27th Battalion to the Royal Inniskilling Fusiliers.

New Zealand Forces.—The 8th New Zealand Mounted Rifles (Nelson) to the 10th Royal Hussars (Prince of Wales' Own).

Union of South Africa Active Citizen Force.—The 4th Mounted Rifles (Umvoti Mounted Rifles) to the 7th Queen's Own Hussars: The South African Corps of Signals to the Royal Corps of Signals.

AUSTRALIA.

Several Australian general officers have made comments on Lieutenant-Colonel Lambert Ward's statements in regard to the death penalty for cowardice

in the field in the House of Commons on 29th March, during the debate on the Army and Air Force (Annual) Bill and in particular to the statement that he had seen orders that if an Australian machine-gunner quitted his post he was to be shot on the spot.

Lieutenant-General Sir John Monash said: "It is an absurd lie and perfectly ridiculous. Men had been sentenced to death, but the sentence could not be executed without the consent of the Commonwealth Government, which was never given."

Lieutenant-General Sir H. G. Chauvel, Chief of the General Staff, said: "Not only is the statement wrong, but never in my experience was there a single instance of a machine-gunner quitting his post."

Brigadier-General H. E. Elliott, who served as a Brigade Commander in Gallipoli and France, said: "Never has such a ridiculous statement been made in regard to the Australian Forces."

Major-General J. H. Bruce, G.O.C. 1st Division (Sydney), said that the statement was "grossly untrue. The suggestion that Australians were summarily shot on orders from higher authority is too ridiculous."

Major-General Sir Charles Rosenthal said: "It is a fabrication. The Australian Government took a definite stand in face of which no Australian officer would have dared to issue an order for the summary shooting of men."

—*Times*, 4th April.

INDIA.

SUMMARY OF THE REPORT OF THE INDIAN SANDHURST COMMITTEE. *Dated 14th November, 1926. (H.M. Stationery Office. 3s.)*—In issuing the Report of the Indian Sandhurst Committee, the Government of India, in a foreword "consider it necessary to emphasize that neither they nor His Majesty's Government have yet formed their conclusions on it, and that those conclusions must necessarily take account of certain factors of which it was not within the province of the Committee to undertake a complete survey." They go on to say that they must leave themselves free to consider "whether alternative methods, which did not fall within the Committee's terms of reference, might not more profitably be explored" than a scheme of increasing Indianisation extending over a number of years.

The Committee was constituted with the Chief of the General Staff in India (Lieutenant-General Sir Andrew Skeen, K.C.B., K.C.I.E., C.M.G.), as Chairman, and twelve other members, of whom only one was British, i.e., Mr. E. Burdon, C.S.I., C.I.E., Secretary to the Government of India in the Army Department. The Indian gentlemen of the Committee represented both Indian military and political opinion. Questionnaires were framed for the Governors of Provinces and Local Governments, the general public, educational authorities, Indian States, commanding officers of regiments in which were Indian King's commissioned officers trained at Sandhurst, parents of Sandhurst trained Indian cadets, Indian cadets themselves, and Viceroy's commissioned officers. One hundred and twenty-two special witnesses were examined orally, among which were civilians representing all shades of thought and all parts of India.

The terms of reference were: "To enquire and report:—

"(a) By what means it may be possible to improve upon the present supply of Indian candidates for the King's Commission, both in regard to number and quality.

"(b) Whether it is desirable and practicable to establish a Military College in India to train Indians for the commissioned ranks of the Indian Army.

"(c) If the answer to (b) is in the affirmative, how soon should the scheme be initiated and what steps should be taken to carry it out.

"(d) Whether, if a Military College is established in India, it should supersede or be supplanted by Sandhurst and Woolwich so far as the training of Indians for the commissioned ranks of the Indian Army is concerned."

The recommendations of the Committee are that Indianisation should be greatly extended, and facilities should be provided in India to train young Indians for King's commissioned ranks. The measures which it is considered that a substantial and progressive scheme should provide are:—

"(a) In 1928, the number of vacancies, at present ten, allotted to Indians at Sandhurst should be doubled, and thereafter should be increased progressively until a Military College on the lines of Sandhurst is established in India.

"(b) Indians should be made eligible to be employed as King's commissioned officers in the Artillery, Engineer, Signal, Tank and Air arms of the Army in India. . . . From 1928 eight vacancies should be allotted to Indians at Woolwich and two at Cranwell, and these numbers should be increased progressively in due proportion.

"(c) In 1933 . . . a military college, with an establishment at the start of 100 cadets doing a three years' course, should be created in India on the model of Sandhurst . . .

"(d) In order to secure the maintenance of the Imperial connection in military matters, twenty vacancies should continue to be reserved for Indians at Sandhurst after the opening of the Indian Military College."

Under the scheme proposed, half the total cadre of officers in the Indian Army would be Indians in 1952.

The Committee point out various defects in the educational system of India, particularly in the training of character. They were impressed by the fact that the percentage of failure among the Indian cadets at Sandhurst was thirty; the corresponding percentage among British boys being three. They acknowledge that the Indian boy is handicapped "especially in a sphere where physical considerations and general aptitude for dealing with and controlling men are of equal importance with purely intellectual attainments." They recommend that the Prince of Wales' Royal Military College, Dehra Dun, should be expanded, and if circumstances demand it a second College on the same lines should be opened. The control of such colleges should remain in the hands of the military authorities, but the course of education should secure a qualification recognised by the University authorities.

The upper age limit for entrance to the Army, which is higher by one year than that prescribed for British boys, should remain unchanged for the present. But the ultimate aim should be to reduce it to an equality as regards age with British boys. The entrance to the Indian Military College should be by open competitive examination. The basis of selection should be wide and no preference given to any particular class or community. "No pains should be spared to place the machinery of the Indian Military College on the highest plane of efficiency which India can attain. The instructors should be mainly British officers and should be picked men. If necessary, specially attractive terms of remuneration should be offered in order to secure teachers of the highest capacity and reputation."

" Indian cadets who are commissioned from the Indian Military College should be attached to a Cavalry or Infantry unit in the United Kingdom for a period of one year."

The " eight unit scheme " is severely criticised. Under this scheme the appointments in these particular regiments were to be filled up by the gradual transference of Indian officers qualified by their rank and length of service, so that the process of Indianising them would continue uninterruptedly as the officers gained seniority and fitness. Simultaneously with the Indianisation of these units Indians were to continue to be posted to other units of the Indian Army. The Committee consider this scheme should be abandoned, and the original plan reverted to, whereby Indians were to be eligible for appointment to any unit.

" With Indianisation proceeding in the Army in any measure, the only means of ensuring successful Indianisation and, concomitantly, the maximum degree attainable of military efficiency, is to allow Indian officers to serve shoulder to shoulder with British officers, each learning from the other in every unit of the Indian Army."

They recommend that the grant of King's commissions be extended to suitable Indian students of British Universities. To make this proposal effectual, the officers' training corps at the Universities should again, as during the Great War, be thrown open to Indians. The introduction of this system into the Indian Universities, would, however, they say, be premature and infructuous, because they are in a state of transition. They also recommend that a certain number of additional vacancies at the Indian Military College should be reserved for Indian States which may wish to avail themselves of the opportunity to give higher training to some of the officers of their State forces.

One sub-committee, consisting of the chairman and two Indian gentlemen, toured the Indian Universities for the purpose of studying on the spot the extent to which suitable candidates for an Army career are to be found in these institutions. Another sub-committee of three Indian gentlemen visited England, France, the United States and Canada, to study the military institutions in those countries, and the systems of education which usually preceded admission to the military colleges.

It was as a result of the latter sub-committee's report that the Committee arrived at the conclusion to recommend a three years' course for the suggested Indian Military College. They say: " While India is on the same footing as England and France in that she required a regular supply of officers for service in a large standing army, she has something in common also with Canada and the United States in that the civil educational system is at present defective and cannot be so improved in the near future as to ensure that a generality of cadets, when they first arrive at the military college, can be turned into really efficient military officers after only a short period of military training. We feel therefore, that the course at the Indian Military College should be longer than the course at Sandhurst and should, in addition to the military subjects, include a period of academic study as well, by means of which the cadets will be able to improve their general education and their knowledge of colloquial English. It is also important that the academic standard attainable at the end of the course should be so framed as to secure specific recognition from the Universities and to enable cadets who for one reason or other are found unfit for commissions in the army, but are suitable for other careers, to continue their education at an University, without interruption and on a level with their contemporaries in age. Our recommendation therefore, is that the course should last three years, of which the first

year should be devoted mainly to academic study, and the last two mainly to military training. A longer course of this nature will have the further advantage that it will give those cadets who are drawn from the ordinary Indian schools a better opportunity of developing in character and physique than would be afforded if they were to remain at those schools for a further year and a half, and then undergo a short course of a purely military nature."

FOREIGN.

ITALY.

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THE ARMY REFORMS OF 1926.

I. *General.*—The Army Reform Bills of 1926 are the work of General Cavallero, the Under-Secretary of State for War. They were "tabled" in the Chamber of Deputies on 19th January, and passed by an overwhelming majority on 30th January. They were next subjected to close scrutiny by the Military Committee of the Senate, and finally approved by the Senate on 10th March.

The principal Bills, since amplified by hundreds of decrees, were seven in number, and dealt with :—

- (i) The Re-organization of the Army proper—i.e., the combatant arms, the non-combatant services and the staffs of both ;
- (ii) The Promotion of Officers ;
- (iii) The Legal Status of Officers of the Army, Navy and Air Force ;
- (iv) The Central Administration of the Army, including civil personnel employed under its orders ;
- (v) The Treatment of Disabled Ex-service Men ;
- (vi) Officers' Marriage Dowries for Prospective Wives ;
- (vii) The Formation of a Chaplains' Department.

Of the above Bills the first is by far the most important, and it is the only one that merits special notice. But before the first Bill is dealt with in detail, it will be well to enumerate the following points contained in the preamble of the seven Bills as laid before the Chamber of Deputies :—

- (a) Of the three fighting Services the Army is the most important ;
- (b) It is essential to provide for the rapid mobilization of all the resources of the State, and particularly for the rapid mobilization and assembly of the Army. In order to ensure that supplies of war material and mobilization equipment are always maintained in sufficient quantities and in good condition thirty special Mobilization Inspectorates (one for each Divisional Area) will be created ;
- (c) In spite of the greatly increased power of mechanical contrivances it is still the human element, the soldier, that counts for most in war. In fact, the greater the improvement in mechanical contrivances, the higher must be the qualities of the men who are to use or to oppose them ;
- (d) The period of military service will continue to be eighteen months for all male citizens, excepting a small percentage who may be entirely

exempt for family reasons by the Minister of War. The Minister may also dismiss from the colours a further percentage (limited to 50,000), provided :

That they can plead family reasons similar to those of exempted men ;

That they have served for not less than six months ;

That the strength of the unit is not unduly reduced. No man, however, shall be eligible for total exemption, or for dismissal after six months' service unless he has passed the prescribed courses of pre-military training with the National Militia.

- (e) One annual contingent or " class " of recruits produces a total of about 230,000 physically fit men, of whom about 30,000 may be exempt. One quarter of the remainder may also be dismissed after a reduced term of service of not less than six months. The minimum strength of the Army is fixed at 150,000, which figure will be adhered to in the non-training season—that is, during the winter months. During the training season (April to September) two annual classes will overlap, and the actual strength during this season will average about 325,000. The budget strength may be taken as 220,000.

2. *The Re-organization of Higher Formations and Units.*—In order to avoid interference with military training, all such portions of the Reform Bills as entailed re-distribution of troops were held in abeyance during the summer, and not given effect to until 2nd October. On that date the re-grouping of troops began : it has since been pushed on with commendable rapidity, and there is every prospect that it will be completed before the opening of the next training season.

Under the Diaz organization the Italian Army had nine army corps on the Continent and one on the Island of Sicily, each army corps averaging three divisions. Under the Cavallero organization this arrangement has been modified. The Sicilian (Palermo) Army Corps has been abolished as such, a new army corps, with headquarters at Alessandria, has been formed in its stead, and Sicily and Sardinia have been converted into separate " Island Commands." There are thus still ten army corps, but they are all on the Continent, whilst the formation of the two Island Commands provides for the local defence of the islands concerned.

The number of divisions in each army corps varies from two to four, and is as follows :—

Ist Corps, Turin	2 divisions
IInd Corps, Alessandria	3 "
IIIrd Corps, Milan	3 "
IVth Corps, Verona	3 "
Vth Corps, Trieste	4 "
VIth Corps, Bologna	3 "
VIIth Corps, Florence	2 "
VIIIth Corps, Rome	2 "
IXth Corps, Bari	2 "
Xth Corps, Naples	3 "
Sicilian Command	2 "
Sardinian Command	1 division

It will be observed that the strongest army corps of all is the one on the frontier of Yugo-Slavia.

3. *Composition of Armies and Expansion in case of War.*—In the event of war the ten army corps will be formed into four field armies, for each of which an army commander designate is appointed in time of peace.

Under the Diaz organization it was reckoned that on mobilization the thirty peace-time divisions which then existed would be expanded to sixty. Under the Cavallero organization it is probable that, including three light divisions and allowing for expansion of three Alpini brigades, the total number of divisions and equivalent formations intended to take the field will also be sixty.

4. *Military Training.*—With respect to training, it is difficult to estimate the standard of efficiency attained by the Italian Army; but there is no reason to suppose that, except possibly in the case of Alpini troops, that standard is particularly high; nor is it likely to become high until a halt is called to incessant change in organization and until properly co-ordinated training regulations are drawn up for all arms. In this connection it is an astonishing fact that, although eight years have elapsed since the Great War came to an end, no training manuals in the proper sense of the term have yet been issued. Besides a short document containing general instructions for the training year 1926-27, only one small volume, dealing with a part of artillery training, has been published. It is, of course, possible that further instructions have been issued confidentially, but so far as known all other arms are still without any training manuals. Books on combined training, like the British Field Service Regulations, do not exist. The consequence is that even officers going up for promotion examinations have no means of knowing the difference between right and wrong. They can only trust to luck and hope that such opinions as they express may happen to coincide with those of the examiners. In such circumstances the standard of training can scarcely be high, whilst uniformity of training must be impossible.

5. *Conclusions.*—From what has been said it will be evident that, although much still remains to be done, considerable strides have been made in the right direction. The mere fact that the composition of higher formations has been more or less definitely settled is in itself a distinct gain. The territorial limits allotted to individual army corps and divisions appear to be an improvement on those under the old scheme, which left much to be desired from a strategical point of view. But there can be no doubt that the latest re-organization, as a whole, is a great improvement upon anything that Italy has had before. It does not materially alter the country's fighting strength in point of numbers, but it should greatly facilitate training, administration and mobilization.

Another advantage of the highest importance will accrue to Italy if, through the Cavallero reforms, she at last secures a military system that will be stuck to and that will put an end to the disturbing effects of the incessant changes that have been the bane of her army for the last seven years. She now has a sound foundation to work on: it only remains to be seen whether she possesses sufficient steadfastness of purpose to keep an even keel and a straight course. Owing to certain inherent defects in the Italian character, this point must always be open to doubt. But the leaders of military thought in Italy to-day are able men and, provided that the present Government continues in power, there is no reason why they should fail. Strong, inspiring leadership is what the Italian Nation and the Italian Army need every time and all the time; given that they may achieve anything; without it they will go to pieces. There is probably no race of which it may be said more truly that "men are nothing, the man is everything." Whether "the" man will be found when the next war breaks out is on the knees of the gods; but, until it is quite certain that he is not forthcoming, it will be dangerous folly to under-estimate the fighting value of the Italian Army.

AIR NOTES

ROYAL AIR FORCE.

PERSONNEL.

FLYING TRAINING.—The final visit to complete the tour of all Flying Training Schools at home, by the Commandant of the Staff of the Central Flying School was paid to No. 1 Training School, Netheravon, between the 3rd January and 14th January, 1927. It is proposed to continue these visits during 1927. They will be made in the breaks between courses at the Central Flying School and a programme has been arranged accordingly.

The gradual replacement at all Flying Training Units of the Avro 504K Mono by the Avro 504K Lynx is being proceeded with as the newer type of aeroplane becomes available. It is hoped that No. 2 Flying Training School, Digby, will be equipped before July, 1927.

No. 1 Flying Training School, Netheravon, reverted to the training of naval officer pupil pilots for the Fleet Air Arm on the 1st January, 1927. The aeroplane establishment of this Unit will therefore be re-organized during April, 1927, when the present course of R.A.F. pupil pilots complete their training and the first course of naval officer pupil pilots are ready to fly Service aircraft.

R.A.F. CADET COLLEGE.—In December, twenty-seven cadets successfully completed their courses of instruction at the R.A.F. Cadet College, Cranwell, and have been granted permanent commissions in the R.A.F.

AIRCRAFT APPRENTICES.—A total of 537 aircraft apprentices have completed their courses at No. 1 School of Technical Training, Halton, and Electrical and Wireless School, Flowerdown. Four of these aircraft apprentices have been awarded cadetships at the Royal Air Force Cadet College, Cranwell.

NAVAL CO-OPERATION.

FLEET AIR ARM AND COASTAL RECONNAISSANCE UNITS.

IN HOME WATERS.—Fleet Air Arm flights have not operated in Home waters during this quarter, owing to the movements of H.M. Carriers.

No. 480 (Coastal Reconnaissance) Flight have carried out their routine programme of training and co-operation with naval units.

MEDITERRANEAN.—The Mediterranean and Atlantic Fleets carried out combined exercises in the Mediterranean, during which the Fleet Air Arm flights from H.M. Carriers "Furious" and "Eagle" were actively employed throughout.

No. 481 (Coastal Reconnaissance) Flight at Malta have co-operated with the Naval and Military Units stationed at Malta, and have continued their normal routine of training and exercises.

CHINA.—H.M. Ships "Hermes," "Vindictive" and "Enterprise" have been in Chinese waters during the quarter, and their aircraft have been employed in connection with the general situation on that station.

H.M.S. "Argus" arrived at Hong Kong on 12th March, with a full complement of aircraft and later proceeded to Wusung.

[See also NAVY NOTES, p. 429.]

OVERSEAS COMMANDS

EGYPT.

A Royal Air Force Flight of four Fairey 3.F's, under the command of Air-Commodore Samson, C.M.G., D.S.O., A.F.C., left Heliopolis on the 30th March on a Service training flight to Cape Town, the route being the same as that taken by Wing-Commander Pulford last spring. On the same date a Flight of three machines of the South African Air Force left Pretoria and met the Royal Air Force Flight at Kisumu on the 5th April. After visiting Nairobi for co-operation with the 3rd King's African Rifles, both Flights proceeded in company to Pretoria, arriving there on 16th April. The R.A.F. Flight proceeded thence to Cape Town alone and were re-joined at Grahamstown by the South African Flight. After three days spent there in co-operation with Union Forces, both Flights returned to Pretoria, via Durban, on 2nd May.

The R.A.F. Flight, which has, up to date, kept exactly to programme were due to leave Pretoria on 9th May and is due back at Heliopolis on 22nd May.

CAIRO-BAGHDAD SERVICE AIR MAIL.—During the months November and December the Service Air Mail operated as usual. As a result, however, of the establishment by Imperial Airways, Ltd., of a civil air transport service between Cairo and Karachi, the Service Air Mail between Cairo and Baghdad which has operated regularly since 1st August, 1921, has been discontinued. The last Royal Air Force machines to operate on this Air Mail route arrived at Cairo on 9th January. The details for the period are as follows:—

	November.	December.
No. of aircraft flights	6	8
Weight of mail carried	1,675 lbs.	1,815 lbs.
No. of passengers conveyed	16	15

INDIA.

A considerable amount of Army co-operation work with cavalry, infantry and artillery has been carried out during the period under review. During the autumn very successful co-operation was carried out with the Chitral relieving columns. While the relief was in progress, the Royal Air Force made daily patrols over the columns on their march up to and down from Kila Drosh as far as the Laorai Pass; mails were dropped to the troops daily.

During January, the Razmak Column marched from Razmak to Datta Khel, via Idak, the Sarqhaluna Nala and Miranshah and returned via Mohammed Khel and Razani. The march, which was supported by aircraft co-operation, was carried out without incident.

IRAQ.

During the period under review, a few small raids were carried out in northern Iraq, but apart from these the situation has been quiet, and no operations have been necessary.

REDUCTION OF FORCES.—Following on the reduction of forces mentioned in last quarter's Notes, the remaining Flight of No. 45 (B) Squadron was withdrawn during January. No. 8 (B) Squadron was withdrawn during February, and has moved to Aden, to replace the Flight already stationed there. The British battalion, King's Liverpool Regiment, was withdrawn in March.

NORTHERN IRAQ.—Owing to a number of small raids carried out by the Syrian Tai tribe on Iraq tribes occupying the villages situated North of the Jebel Sinjar, permission was obtained from the French authorities in Syria for action to be taken by the Iraq Government against the Tai within the provisional boundaries of the Iraq administration. An air reconnaissance was accordingly carried out on the 4th January by nine machines of No. 6 Army Co-operation Squadron, and messages were dropped on the offending tribe, ordering the responsible headman to report to the Administrative Inspector, Mosul, by the 10th January. This order was not obeyed. A further reconnaissance was therefore carried out on the 10th January and it was found that nearly all the Tai camps had moved away into Syrian territory, West of the Iraq-Syrian administrative boundary, thus moving beyond the reach of air action from Iraq. The action taken, however, appears to have had a chastening effect on the Tai, as a letter was received promising to restore all loot taken from Iraq tribes since last summer and to comply with all orders of the Iraq Government.

After many postponements, the conference between French and British officials on the subject of the incident between followers of Daham and Ajil, the respective chiefs of the Syrian and Irak Shammar Jarba at Al Bidi on 2nd April, reported in these Notes, took place at Al Bidi on the 7th January. The French officers inspected the trenches, main firing positions, etc., and also the camp of Daham. In order to settle outstanding claims and to endeavour to conclude arrangements for the cessation of raiding, a meeting between the Iraqi and Syrian Sheikhs has been proposed to take place at Anah.

ARMoured CARS.—During January a section of No. 4 Armoured Car Company carried out a reconnaissance of the Southern Desert in order to gain knowledge of the country in case of Akhwan raids. The cars left Basrah on 20th January, and visited Halibah, Rukhaimiyah, Busiyah, Abu Ghar and Jalibah. Four days were spent in reconnoitring with Fords across the sand belt from Abu Ghar to Jalibah. A track was made good for light cars, but it is not considered fit for the use of armoured cars.

A reconnaissance of the Afaj—Shatt al Khar area, East and South-East of Diwaniyah, was carried out during February by Rolls Royce armoured cars and armed Fords of No. 4 Armoured Car Company. The object of the reconnaissance was to ascertain if the terrain was suitable for the use of armoured cars and also to acquaint the personnel with the district. The cars left Hinaidi on the 14th February, and visiting Afaj, Khidhr and Tel Ede, returned across the Jezireh to Hinaidi where they arrived on 6th March.

SULAIMANIA.—The negotiations between the Iraq Government and the envoy of Sheikh Mahmoud, Sayed Ahmad Marakhas, referred to in last quarter's Notes, were brought to a conclusion on the 20th January. Sayed Ahmad, although not in a position to assent finally to the proposed terms, stated that he would do all in his power to persuade Sheikh Mahmoud to accept them. Briefly the proposed terms provide for the permanent residence of Sheikh Mahmoud and certain members of his family on the Persian side of the frontier, and prohibit their entry into Iraq territory, and their interference in the administration or affairs of Sulaimania. They also allow the Iraq Government the option of resorting to any action deemed necessary, in the event of Sheikh Mahmoud or members of his family failing to observe the terms. Sheikh Mahmoud has replied stating that he is prepared to accept these terms subject to certain promises set out in the report of the League of Nations Commission regarding national and legal rights of the Kurds being

carried out. He has been informed that he has misunderstood these promises and that if he fails to accept the terms without further delay, his estates will be disposed of.

WESTERN IRAQ.—Aid ibn 'Ajil, one of the three leaders of the Nejd Shammar party which raided camels from the Kuwait tribes in October (see last quarter's Notes) has been captured, and is now in prison at Ramadi, awaiting trial.

BRITISH CIVIL AVIATION.

REPORT ON THE PROGRESS OF CIVIL AVIATION.—A Parliamentary report on progress in civil aviation at home and abroad during the last nine months of 1926 is about to be published by H.M. Stationery Office. This is a continuation of the series of half-yearly or annual reports that began in 1919. For the future the reports will cover calendar years instead of financial years and the present one relates to the nine months from the end of the fiscal year 1925-26 to 31st December, 1926. It deals extensively with the principal developments made in 1926 in every part of the world, but more especially in Great Britain and the Empire. The price will be about 2/-.

AIR TRANSPORT IN EUROPE.—The summer time-tables of European air transport services came into operation almost everywhere with the introduction of Summer Time on 10th April, or shortly afterwards. Most of the companies have reported very considerable increases of traffic in 1926 and are preparing for a still larger increase in 1927. The route mileage flown regularly last year in Europe amounted to over 28,000. In the course of the year Imperial Airways, Ltd., operating only 904 miles of route, flew 778,980 miles (nearly 550 million horse-power miles), and their passenger and goods traffic attained record figures, viz. :—

Passengers, actual number	16,775	} 41½% increase over 1925.
Passenger-miles	3,746,000	
Cargo, tons	679	} 7½% increase over 1925.
Cargo, ton-miles	159,000	
Total, ton-miles	493,000	21½% increase over 1925.

The German combine, the Deutsche Luft Hansa A.G., operating 12,762 miles of route, flew 3,816,000 miles and carried 56,268 passengers (actual) and 929½ tons of cargo, whilst the French companies combined, with 6,290 miles of route, flew 3,243,900 miles and carried 18,861 passengers (by stages) and 1,636½ tons of cargo, corresponding to 4,096,000 passenger-miles and 340,460 cargo ton-miles.

THE CAIRO-KARACHI ROUTE.—The complete fleet of five machines of the D.H.66 (Hercules) type, for service on the Cairo-Karachi route, has now flown out from England. Like the machine which conveyed the Secretary of State for Air to India, each one of the remaining aircraft was flown to its station with clockwork regularity and with no mechanical troubles, although only delivered from the makers a few days before starting out. It is noteworthy that the large saving of time effected by the Secretary of State and his party in flying to India occasioned no extra expense since the cost of travelling by air was practically the same as it would have been had they gone by sea. A regular service is now being run by Imperial Airways, Ltd., weekly, in each direction, between Cairo and Basra. The extension to Karachi had been planned to begin shortly, but is subject to the agreement arranged with the Persian Government receiving the assent of the Majlis.

THE KHARTUM-KISUMU EXPERIMENTAL SERVICE.—Ill-luck has again overtaken the civil demonstration flights between Khartum and Kisumu at the inland terminus of the Kenya and Uganda railway. Through the accident to the Fairey III.D seaplane which was loaned by the Royal Air Force when the D.H. 50 "Pelican" was damaged in taxiing on the Nile, the work will have to be further delayed until repairs to the "Pelican" are completed. The importance to the East African Colonies of direct and rapid communication through the Sudan and Egypt to England needs no emphasis and the ultimate success of the trials cannot be doubted.

AVIATION IN FOREIGN COUNTRIES

CHINA.

The *North China Herald*, of 29th January, 1927, publishes a photograph of a Junkers F.XIII passenger machine fitted with floats, belonging to the Cantonese Army.

FRANCE.

ARMY REORGANIZATION.—In an article on France, which appears in this issue will be found allusion to a comprehensive scheme of Army Reform, which is being laid before the Chamber of Deputies this spring.

The change in the organization of the Military Air Service that will be brought about after the passage of the Bills in their present form, will be the addition of four squadrons to the existing 132. It has been stated by the Ministry of War that these new squadrons will be for Army Co-operation duties.

The indirect effect of the Bills, which include a proposal for the reduction of the term of military service from eighteen months to one year, will be most marked in the Military Air Service. At present great difficulty is experienced under the short period of eighteen months, because, by the time that training is completed, whether for flying or technical duties, a very small time is left for service in an operational unit. This trouble naturally will be increased when the term of duty is only twelve months. The Ministry of War have in the past attempted to get over this difficulty by the following methods:—

1. The Boursier system, for both pilots and mechanics. This is a scheme whereby youths, in the year before they are due to be called to the colours, attend a school, as civilians, where their flying or technical training is completed as far as possible. On incorporation, therefore, these men are enabled to take their places in Service units after a very short delay.
2. The bonus system for re-engagements. There is a sliding scale, increasing the amounts substantially for long terms of service.
3. Better conditions of service for volunteers, with increased chances of promotion.

In order to compete with the approaching reduction of service, the methods given above will have to be made still more attractive and far-reaching.

The Staff of the Military Air Service have expressed their apprehension emphatically on the results of the introduction of the one year term of duty and have stated they see no immediate solution.

NAVAL AIR SERVICE.

NEW SQUADRONS.—In the Estimates for 1927, provision has been made for the formation of three new squadrons during 1927, but they will not be in full commission until the middle of 1928. When these squadrons are formed, there will be seventeen squadrons on an active basis.

AIRCRAFT CARRIERS.—The only aircraft carrier (the "Bearn") in the French Navy was commissioned for trials on 1st October, 1926, and during the autumn was reported to be 87 per cent. complete.

APPOINTMENT.—Capitaine de Vaisseau Laborde was succeeded as Chief of the Naval Air Service by Admiral Frochot during 1927.

COLONIAL AIR SERVICE.

The formation of the additional half squadron in Indo-China, which was envisaged in the 1926 Estimates, did not take place during 1926, owing to the rise in cost of material, increases in pay of personnel, and the rise of the piastre *vis-à-vis* the franc. It is intended that it shall be formed during 1927, after which the strength of the Colonial Air Service will be three and a half squadrons, of which one will be in West Africa, the remaining two and a half in Indo-China.

MOROCCO.—On the surrender of Abdel Krim, and the suppression of the revolt in Morocco, the aviation units that had been transferred to that country as reinforcements returned, with one exception, to their normal stations. This exception was the Naval Air Service squadron 5 B 2, stationed at Fez. This unit, equipped with twin-engined Farman-Goliath Jupiters, remained to complete a photographic reconnaissance of Morocco, for cartographical purposes.

The normal air garrison, the 37th Regiment, of ten squadrons, is distributed throughout Morocco, on a very mobile basis.

FLYING TIMES.—It was officially stated that in the two years ending 31st October, 1926, the Military Air Service flew 336,831 hours, equivalent to 32 million miles.

GERMANY.

A competition known as the "Saxony Flight," which has been duly approved by the Deutscher Luftrat, is to be held in September next in connection with the Leipzig Autumn Fair. The object of the competition is to promote the construction of light aeroplanes and sporting aircraft. Pilots must be German Nationals. Aircraft must be single-seaters or two-seaters constructed and registered in Germany. Foreign engines are allowed.

ITALY.

MARCHESE DE PINEDO'S ATLANTIC FLIGHT.—The Marchese de Pinedo has accomplished another noteworthy long distance performance in the completion of the first two stages of a flight round the Atlantic; the distance covered up to 29th March was over 16,000 miles.

The Marchese, accompanied by Captain del Prete and Signor Zaccchette, left Elmas (Sardinia) on 13th February in a Savoia 55 twin-hulled seaplane, equipped with two 500-h.p. Isotta Fraschini, Asso engines, and arrived at New Orleans, Louisiana, on 29th March, having alighted at the following places *en route*:—

Capo de Gata (Spain), Kenitra, Villa Cisneros (Rio di Oro), Bulama (Portuguese Guinea), Porto Praya (Cape Verde Islands), Fernando Noronha, Pernambuco, Bahia, Rio de Janeiro, Santos, Port Alegre, Buenos Aires, Montevideo, Parana (Argentina), Asuncion (Paraguay), Corumba (Brazil), San Luiz de Caceres (Brazil), Matto Grosso (Brazil), Guajara Mirim (Brazil), Manacos (Brazil), Itacoatiara (Brazil), Para (Brazil), Paramaribo (Dutch Guiana), Georgetown (British Guiana), the Islands of Guadeloupe, Haita and Cuba.

The total distance flown over the Atlantic was 2,350 miles, the longest non-stop stage, Porto Praya-Fernando-Noronha being 1,450 miles. With the exception of stops of two or three days' duration at Bulama, Porto Praya and Para, and one of about two weeks at Buenos Aires, the flight was carried out on consecutive days. The first 3,000 miles were covered in three days. Engines were changed at Buenos Aires after 8,500 miles.

On 6th April, when about to leave Hot Springs to continue the flight, his aeroplane accidentally caught fire and was destroyed.

A new aeroplane was sent out from Italy to New York and early in May the Marchese reached Boston.

SCHOOLS OF AERONAUTICAL ENGINEERING.—By Royal Decree of August, 1926, a school of Air Engineering was instituted in the Royal School of Engineering, Rome. The object of the school is to promote the progress of the science and art of aeronautics, and to provide scientific and technical preparation for the profession of air engineering and for the career of officers in the Royal Corps of Air Engineers.

By Royal Decree of October, 1926, the Statutes of the Royal School of Engineering at Naples were approved. One of the subjects is Industrial Engineering, including mechanics, electro technology, chemistry and aeronautics.

AIR TECHNICAL COMMITTEE REORGANIZATION.—The Air Technical Committee, which has recently been re-organized, is directly responsible to the Italian Air Minister for technical and experimental research and for the study and tests of aircraft material.

AIR ESTIMATES, 1927-28.—The Italian Air Estimates for the next financial year, 1st July, 1927, to 30th June, 1928, amount to 700 million lire (£6,250,000 at the present rate of exchange).

A comparison between the Estimates for 1926-27 and 1927-28 indicates that there is to be little change in the allocation of money between the various heads.

Deducting allotments to extraordinary expenditure and civil aviation, the sum which remains to be devoted purely to the Air Force is 634,000,000 lire, an increase of 4,800,000 lire in 1927-28.

The increase of 5½ million (or 18.3 per cent.) on the 30 million voted in 1926-27, making a total of 35½ million lire, for civil aviation represents the greatest comparative increase under any one heading between the two years.

JAPAN.

The regular East and West Air Service Co., which carries out a weekly service between Tokyo and Osaka, is having three Dornier Murkur metal landplanes built at the Kawasaki Dockyard, Kobe. The machines are to be fitted with one 400-h.p. Lorraine engine, each and will carry one pilot, one mechanic and four passengers.

The machines at present in use by this company are Salmson 2A2 and Brueget XIX A.28.

PERSIA.

The Junker (German) Aviation Company have now concluded an agreement with the Persian Government which enables them to carry mails and passengers on certain routes in Persia. One route, that from Teheran to Pehlevi on the Caspian Sea, with an extension to Baku in the Caucasus, has already been opened. Actually, when the route was inaugurated in March the Russians suddenly negated the permission for aeroplanes to land at Baku, so for the present the route is only in use from Teheran to Pehlevi.

The service is to be a weekly one, leaving Teheran on Tuesday morning and arriving, when permission has been afforded, at Baku the same evening, in order to connect with the Baku-Moscow express. The Junker Company hope in the future to establish a connection at Baku with the proposed Moscow-Baku air line, in which case mails from Teheran should reach Western Europe in less than six days.

PORTUGAL.

WORLD FLIGHT.—On 2nd March, Lieutenant Colonel Sarmento Beires and three companions left Alverca do Ribatejo in a Dornier-Wal flying boat equipped with two 450-h.p. Lorraine Dietrich engines, in an attempt to fly round the world. They arrived at Bulama, Portuguese Guinea, on 6th March, and attempted to cross the Atlantic on 11th March, but were forced to alight at Bissagos Island. On 16th March, at 6.15 p.m., they left Bissagos, reached Fernando Noronha at 11.25 a.m. on the following morning, Natal on 18th March, and Pernambuco on 20th March. The total distance flown over the Atlantic was 1,700 miles.

The party was, on the 4th April, detained at Pernambuco waiting for an airscrew to replace one that had been damaged. The projected route from Pernambuco is: Chile, Juan Fernandez, Samoa, Fiji, Australia, Noumea, Timor, Batavia, Singapore and thence westward to Portugal.

Doubt has been expressed by Lieutenant-Colonel Beires as to the possibility of crossing the Pacific from Juan Fernandez to Easter Island, owing to the limited lifting power of the machine. One of the party was left at Bulama for the same reason.

TURKEY.

The Aviation League of Turkey, reported to be the most enterprising organization in the country, is still hard at work collecting funds for the purchase of military aircraft in Europe. The League has many methods of obtaining money out of the inhabitants, ranging from lotteries to monopolies on the supply of hats and cinematograph films coming into the country. A number of aircraft have already been purchased, and it is said that a further one and a half million English pounds is still at the disposal of the League.

UNITED STATES.**SERVICE.**

The Estimates for 1927-28, set out below, were signed by the President during March:—

- (a) *Army Air Corps.*—The "direct" appropriations for the fiscal year ending 30th June, 1928, amount to \$20,602,594 (£4,239,217), which is an increase over 1926-27 of \$5,345,900 (£1,099,980).

Out of the above total a sum of \$6,492,550 (£1,335,915) is allotted for the purchase of and construction of new aircraft and equipment. In addition, the Secretary of War, during the fiscal year 1927-28, is authorised to enter into contracts for new aircraft to an extent of \$4,495,000 (£924,897), but such obligations will not be met until Congress authorises payment during the 1928 Session.

From the funds apportioned to the National Guard (a reserve in the form of a territorial organization) a sum of \$787,500 (£162,037) is to be utilised for the purchase of new aircraft for the air units of that organization.

The sum total to be expended on new aircraft for the fiscal year 1927-28 amounts to \$11,775,050 (£2,422,849), which is an increase over 1926-27 of \$4,171,050 (£858,240).

- (b) *Navy Air Service*.—The "direct" appropriations for the fiscal year 1927-28 amount to \$20,299,600 (£4,176,872) which, when compared with the 1926-27 "direct" appropriations show a decrease of \$1,996,688 (£410,842); the decrease, however, is covered by a large increase in contract authorization.

Of the above total a sum of \$4,422,000 (£910,876) is allotted for the purchase of new aircraft and equipment. In addition, the Secretary of the Navy is authorised to enter into contracts, during the fiscal year, for the supply of new aircraft to an extent of \$9,480,000 (£1,950,617). Such contracts, however, will not be settled until Congress meets during the 1928 Session and authorises payment.

The total amount to be expended on new aircraft during the fiscal year 1927-28 is \$13,902,000 (£2,860,493), an increase over 1926-27 of \$1,539,500 (£316,769).

ARMY AND NAVY AIR SERVICES—FIVE-YEAR EXPANSION PROGRAMMES.—

The schemes, although authorised by an Act of Congress during 1926 and due to commence on 1st July of that year, were held up as funds were not provided for that purpose. The Army Air Corps, therefore, delayed the commencement of their programme and it is now to be inaugurated on the 1st July, 1927, as funds have been provided in the Budget for the fiscal year 1927-28. The Navy Department, although without funds, attempted to make a start during 1926 by economising in various ways and applying the funds so saved to the commencement of the programme. They will, however, be short in both aircraft and personnel requirements at the end of the first year, i.e., 30th June, 1927. The Budget for 1927-28 includes a considerable increase in appropriations over 1926-27 for the purchase of new aircraft and equipment. This increase will enable the Navy Department to go ahead with the programme requirements laid down for the fiscal year 1927-28, but even so, they will not be up to schedule at the end of that year, i.e., 30th June, 1928.

VISIT OF U.S. ARMY AIR CORPS UNIT TO CANADA.—On 24th January, twelve Curtiss-Hawk pursuit planes (Curtiss D-12 engine) and one Army transport plane left Selfridge Field, Michigan, on a visit to Ottawa and Montreal, Canada. The object of the flight was to provide a practical test of the mobility of fighting aircraft under the most severe weather conditions in winter. The machines were fitted with skis instead of wheels.

During the flight to Ottawa the pilots encountered snow storms which forced them to fly for many miles at a height of 400 feet over very rough and rugged country. The pursuit machines arrived at Ottawa in formation after a flight of 2 hours 55 minutes. The transport aeroplane, having landed at Camp Borden,

near Toronto, to refuel, arrived later. The following day the flight was continued to Montreal. During this part of the journey they ran into several heavy snowstorms and on two occasions the flight became separated and all the machines forced-landed without accident. The flight arrived at Montreal on 26th January.

On 28th January, the homeward journey was commenced, three machines being left behind at Montreal, as, owing to the severity of the weather, the engine of one machine could not be started, the other two machines remaining to accompany it on the return journey. The flight of nine planes arrived back at Selfridge Field on 30th January, having made stops *en route* at Fisher's Landing and Buffalo, N.Y. The three machines left at Montreal, commenced their homeward journey on the 29th January. All of them experienced engine trouble and forced landings were made. They were supplied with spares, etc., from the transport. One of the planes reached Selfridge Field on 30th January, the other two arriving on 1st February.

The experience gained, as a result of the carrying out of this flight, is considered to be of great value to the U.S. Air Services, particularly the data obtained on the starting of the engines in the extremely cold weather which prevailed throughout the flight. The transport plane, carrying mechanics and spares, proved to be of great use to the flight throughout the journey.

CIVIL AVIATION.

In accordance with the Air Commerce Act of 1926, a Bureau of Commercial Aviation has been established within the Department of Commerce in the charge of a new Assistant-Secretary of Commerce. A sum of \$550,000 has been provided for the Bureau in 1926-27, \$250,000 of which is for general administration expenses and the remaining \$300,000 is to be used for the establishment of aids to air navigation, the organization of additional air mail routes and the construction and operation of the necessary lighting, radio and other signalling and communicating apparatus. Of the 9,700 miles of airways now in operation or proposed for the near future, 2,041 miles are already equipped with lighting apparatus and the Bureau hopes to light a further 1,167 miles during the current fiscal year.

The following are the air mail routes in actual operation :—

Post Office Routes :—					Miles.	Date opened.
New York-San Francisco	..	..	..	..	2,665	8.9.20
New York-Chicago (night service)	..	..	..	..	770	1.7.25
Contract Routes :—						
New York-Boston	..	..	..	..	220	1.7.26
Chicago-St. Louis	..	..	..	..	277	15.4.26
Chicago-St. Paul-Minneapolis	..	..	..	..	384	7.6.26
Chicago-Detroit-Cleveland	..	..	..	..	369	15.2.26
Chicago-Dallas-Forth Worth	..	..	..	..	995	12.5.26
Salt Lake City-Los Angeles	..	..	..	..	589	17.4.26
Elko-Pasco	..	..	..	..	424	6.4.26
Atlanta-Miami	..	..	..	..	740	1.4.26
Cheyenne-Pueblo	..	..	..	..	200	31.5.26
Detroit-Grand Rapids	..	..	..	..	140	31.7.26
Juneau-Petersburg (Alaska)	..	..	..	..	115	1.7.26
Seattle-Victoria	..	..	..	..	78	15.10.20
Seattle-Los Angeles	..	..	..	..	1,073	15.9.26
New Orleans-Pilotown	..	..	..	..	80	1923
Total	..	..	..	..	9,119	

For the present the operation of the Trans-continental Through service and New York-Chicago night services remains in the hands of the Post Office, but steps are being taken to transfer these services to a contractor at an early date. The contractors do not receive a subsidy, but are paid a proportion, usually about 80 per cent., of the air mail surtaxes collected by the Post Office. With a view to encouraging the use of the air mail system a flat rate of 10 cts. per oz. is to be charged for air conveyance of letters over any distance. Hitherto the rate has been fixed according to the number of stages flown, and this basis has not been well understood.

Every branch of civil aviation in the United States has progressed rapidly during 1926. The experimental phase has almost passed and air activities of all kinds, for which boundless opportunities exist, are being energetically developed.

AIRSHIP NOTES

GREAT BRITAIN.

There is little to add to the Notes given in the last issue of the JOURNAL, and the present position of British airship development is fully described in the article on page 365 of this number. The stage of experiment and research has now been concluded and construction of component parts of both the new airships is proceeding.

The memorandum by the Secretary of State for Air entitled "The Approach Towards a System of Imperial Air Communications," which was prepared for the Imperial Conference, has now been published, together with Sir Samuel Hoare's statement to the Conference and the report of the Imperial Air Communications Sub-Committee.¹ The memorandum contains a section on airships. It reviews briefly their past history, indicates the progress which has been made in fundamental research in this country since 1921, and also deals at some length with the meteorological aspect of airship navigation.

PREPARATIONS FOR AN IMPERIAL AIRSHIP SERVICE.

The recommendation of the Imperial Conference that the Dominions should consider the possibility of erecting at their own expense mooring masts, suitable for accommodating the new airships, for the purposes of demonstration flights to be carried out in 1928-29, has already been acted upon by the Dominion of Canada and the Union of South Africa, which have each undertaken to erect a mast. Representatives of the Airship and Meteorological Staff of the Air Ministry are accordingly being sent to Canada and South Africa, and also to Australia, to investigate possible sites for bases. The question of erecting a second shed at Cardington, as also recommended by the Imperial Conference, is now being considered.

FRANCE.

The rigid airship "Méditerranée" has been broken up as the repair of her ballonets was considered too costly and her metal framework was beginning to perish.

UNITED STATES.

The American Service Press reports that some interesting exercises were carried out recently by five dirigibles under the command of Lieutenant-Colonel John A. Paegelow, Air Corps, U.S.A. The airships practised various formations, flying at a manoeuvring distance of one ship's length.

¹ Copies of this publication have been added to the R.U.S.I. Library.

REVIEWS OF BOOKS

The Great Delusion. By "Neon," with a Preface by Arthur Hungerford Pollen. (Ernest Benn, Limited). 12s. 6d.

"The Great Delusion" has attracted unexpected publicity by furiously attacking the widely accepted claims that have been made for aviation. The public has had the vital importance of aviation and their dependence on air power for its security so constantly dinned into them of late, that it is a change to read that: "'Air power' is illusory and 'air supremacy' a will-o'-the-wisp. The development of aircraft for war purposes is a sheer waste of men and money, and, moreover, constitutes a grave danger since expenditure and dependence upon unreliable and futile weapons is a sure road to defeat."

It will be seen that "Neon," as the author calls himself, is nothing if not sweeping in his condemnations. He damns the airship as useless and dangerous, he abuses the aeroplane as uneconomical, unreliable and slow, and finally he introduces a footnote in which he discharges a broadside at the motor car. He approves only of ships and trains so long as they are run on coal and not on oil. Neon's book is, in fact, an expression of the eternally recurrent distrust of the machine, although it does not carry its arguments to their logical conclusion, but is content with tabulating the weak points in aircraft of the present.

In the chapters on airships a strong case is made out, so strong indeed that only the successful development and operation of the new airships can provide a complete answer.

The chapters on aeroplanes are far less convincing, and it is clear that Neon's antipathy to, and understanding of, heavier-than-air flight are less firmly rooted. Indeed, he makes certain errors of fact in this part of the book. Four or five years ago it might have been right to say that "approximately four-fifths of the total power installed is required to maintain the aeroplane and its load in the air against the natural law of gravity," but nowadays the statement is hopelessly wrong.

Again he suggests that air survey is far more expensive than it actually is. In other of his remarks Neon betrays a tendency to employ obsolete statistics to prove that the aeroplane of to-day is ineffective. A general indication of Neon's blindness to recent research is indicated when he says dogmatically: "the Law of Gravity defies research." Is he unaware even of the existence of relativity?

But it is easy to pick holes in Neon's comments on aeroplanes and to show his general attitude to be fundamentally similar to that of the people who desire to see a return to the felicities of the stone age. At the same time "The Great Delusion" teaches the important lesson to those who believe in aeronautics that overstatement is dangerous. It is a well-compiled, challenging book and if it does no more than act as an antidote to excessive optimism and advertisement, it will

have been worth the writing; incidentally it will probably do good to the cause which it seeks to condemn.

The Life of Lieutenant-General H. H. Sir Pratap Singh, G.C.B., G.C.S.I., G.C.V.O., LL.D. By R. B. Van Wart, O.B.E., M.A. (Oxford University Press, London). 12s. 6d.

Mr. Van Wart's little book will be welcomed by many. The only fault one has to find is that an account of a life of such absorbing interest should be restricted to so modest a volume.

The name of Sir Pratap Singh—one has thought, and talked of him so long as just "Pertab"—was a household word in India wherever Englishmen gathered. Stories about him, which seemed almost legendary, abounded; of his self-imposed hardships; of his utter fearlessness; of his prowess in the saddle; of his adventures with wild animals; of his love and reverence for the members of our Royal Family from Victoria, the Queen Empress, to the present Prince of Wales; of his quaint, but very pertinent sayings—yet all were true. Few, however, realised the years of labour which built up the administration of the Jodhpur State. Mr. Van Wart discloses the facts of this achievement, and they add to one's admiration of the character of the man. Born and brought up in the conservative traditions of the most conservative people in India, "Pertab" nevertheless used his opportunities to break down senseless and often cruel customs. There is a remarkable confession of his religious beliefs in Chapter XVII, where it is described in his own words how, after much searching of heart, he found Truth in the ancient Vedas rather than in the teachings of the Brahmin priesthood. He was naturally attracted to the best type of English men and women, and in his relations with the latter showed how high were the ideals of his chivalrous nature. But like a true Rajput his first and his last love was the horse; and to him the cavalry arm was the bright spearpoint of an army. The Jodhpur Lancers, raised, commanded and inspired by him, were a model of the cavalry spirit. But it grieved his gallant soul that in France a cavalry charge never came about as he wished, and in Palestine he was not there when his Lancers did charge. "The great day" for him would have been to meet death like Colonel Dalpat Singh, charging at the head of his regiment. It was typical of the man that, convinced one night in 1920 he was about to die, he should insist on being dressed in uniform and placed in a chair with his sword in his hand so that he might face death like a soldier. If Outram was the Bayard of India, "Pertab" was surely the Bayard of Hindustan.

The Navy of To-Day. By Sir George Aston. (Methuen & Co., Ltd.).

This useful little work is divided into two parts, one giving a sketch of the Service as the author sees it to-day and some comparisons with times gone by, the other dealing with the Navy from a national and international point of view.

In emphasizing what sea-power means to the life of the Empire, the author makes special acknowledgment to Commander G. S. Bowles' *The Strength of England*,¹ whom he alludes to as an educator of his fellow-countrymen in matters upon which not merely their prosperity but their very existence depends.

Admiral Jellicoe, in a valuable Introduction, says that these two books should be read and studied by every citizen of the British Empire.

¹ See R.U.S.I. JOURNAL, November, 1926, page 805.

Land, Sea and Air. By Admiral Mark Kerr. (Longmans, Green & Co.) 21s.

"A sense of humour is the greatest of God's gifts," says Admiral Mark Kerr, in the preface to his "Land, Sea and Air." In this vein he gives us a book of reminiscences, full of well told stories about prominent people. His anecdotes of the Russian and Greek Royal Families, of the German Emperor, of the Sultan of Turkey, of Admiral Prince Louis of Battenberg and of many others are all written, as the author states, from the testimony of an eye and ear witness and they are therefore full of interest. He deals in one chapter with the course of events in Greece in 1913-15, upon which he is fully qualified to speak, and a new light is thrown upon a subject which is still little understood in this country. Then, from the Service point of view, the real interest in the book begins.

In three chapters, written in a more serious vein, he expresses some far-seeing and broad-minded views upon naval strategy and tactics of the past, present and future. What is more, these chapters are written in a manner that can be understood by the ordinary reader and are entirely without technicalities. Admiral Kerr starts by inferring that too many books have been written about the war, and states that he puts forward his observations as those of "one who was in a position to meet many of the leading men in politics and the fighting Services, and on the thrones of Europe, and to hear their opinions and their thoughts of what would happen in the future." He sees a broad horizon in regard to the Battle of Jutland, and sums up his account by saying that "the surrender of the German Fleet was the direct result of Sir John Jellicoe's masterly handling of a difficult problem and that after Jutland the surface of the sea was never disturbed by German ships." How long will it be before this truth is understood?

The author touches upon Coronel and the Falkland Island Battle and gives an account of his own experiences in the Adriatic during the war. In quoting some of his own letters, written before the events, he shows an uncanny faculty for forecasting, and he then deals with the first formation of the Royal Air Force and tells of his own adventures in the Air, including his attempt at the Trans-Atlantic flight.

Admiral Kerr is frankly an advocate of the small craft, whether on, above or under the sea; he believes in unified control of the fighting Services and in the League of Nations. These are matters of controversy and his Chapters XI to XIV will provide food for argument in all three Services. Herein lies the value of a remarkable and many-sided book, which is finished off with a number of good stories of Victorian people and manners, and of the turf. Even though some of the professional views expressed in it will not bear the pressure of logical argument, "Land, Sea and Air" is a book that will repay reading as a piece of good literature.

Basic Principles of Air Warfare; The Influence of Air Power on Sea and Land Strategy. By "Squadron-Leader." (Gale & Polden, Aldershot). 7s. 6d.

This is a useful book for those who desire a manual dealing with the principles of air power. It is, however, necessary to bear in mind that the author is very cautious in his statements and that he relies largely on quotations from the writings—amongst others—of Sir William Robertson, Winston Churchill, the despatches of the Earl Haig and of Sir Hugh Trenchard. The result is that the work, while

strictly orthodox and applicable to the period following directly on the Great War, somehow appears to lack vision as to the future. Nevertheless, it can be recommended to the student of war.

Tactical Schemes from Platoons to Brigades, with Solutions and Notes.

By A. Kearsey, D.S.O., O.B.E., *p.s.c.*, late Lieutenant-Colonel General Staff. (Gale & Polden, Aldershot). 7s. 6d.

The title of this book is ambitious, but the author fairly lives up to his purpose. The 180 pages are replete with useful data and advice. We should have preferred a less dry opening and a different arrangement of the matter; also there is evidence of hurry in the compilation of the book, as may be seen in the bridging notes, where a total of 36 feet of bridge is given as being carried by an "expeditionary force." Remembering the war, one wonders if some of the hints are really practical—for example, the treatment of prisoners, on page 86; did the author ever see a young subaltern and a West Country sergeant, ignorant of German, struggling to examine three or four freshly caught Bavarian privates? Surely not: a counsel of perfection.

Notes on Training for War: Staff College. With Schemes and Solutions and Historical Illustrations of the Principles of War.

By A. Kearsey, D.S.O., O.B.E., *p.s.c.*, late Lieutenant-Colonel, General Staff. (Hugh Rees, Ltd., London). 1926. 5s. od.

In the compass of 90 pages it would be difficult to cover the whole range of subjects required for the Staff College entrance examination. The author has, however, made a bold bid to achieve this end; he has consequently condensed in quite a clear fashion a mass of useful hints and advice on appreciating a situation, tactical schemes, the principles of war, mountain warfare, etc., all illustrated by examples. The value of such a compilation must, however, depend on the capacity of the reader to utilize the tightly packed matter here set before him.

The Autobiography of a Woman Soldier; a Brief Record of Adventure with the Serbian Army, 1916-1919.

By Flora Sandes (Captain, Serbian Army). Illustrated from photographs. (H. F. & G. Witherby, London). 1927 10s. 6d.

This astounding tale of how a woman spent three years as a private and then as sergeant in the Serbian Army is worth reading. Miss Sandes went to Serbia as a nurse and finally exchanged that role for one of a combatant soldier, avoiding no hardships and sharing the lot of the Serbian private in all its details. It is a straightforward plain tale, all the better for being unadorned by any touch of femininity.

DIVISIONAL AND REGIMENTAL HISTORIES.

The Seventh Division, 1914-1918. By C. T. Atkinson, late Captain, Oxford University O.T.C. (John Murray, London). 1927.

This history does full justice to a formation that played a distinguished role during the Great War. The Division landed in Belgium to take part in the Antwerp operations. Its action in the subsequent retreat to Ypres is of great interest in that it caused, to a large extent, that locality to become the scene of the subsequent activities of the entire B.E.F. during the years to come. At Ypres, Festubert and Loos the Division fought with great gallantry; later, again in April, 1917, it distinguished itself at Bullecourt. It is, however, the participation of the Division in the Italian Campaign, first on the Asiago Plateau and then at the final crossing of the Piave in 1918, that will chiefly claim the reader's interest. The whole story is well told.

Britain's Sea Soldiers; A History of the Royal Marines, 1914-1919.

Vol. III. By General Sir H. E. Blumberg, K.C.B., Royal Marines. (Lyceum Press, Liverpool).

This volume is the third of the series which forms the record of the Royal Marines from their formation in the reign of Charles II to the end of the Great War. General Blumberg is peculiarly fitted to write this history, as in the early days of the war his position, first as D.A.A.G., and later as A.A.G., Royal Marines, gave him the first hand knowledge of the organization and expansion of the Corps, which, as the war went on, smoothly, and apparently so easily, met every demand that arose.

Any regimental and corps history is difficult to write, the conflicting demands of detail and matters of personal interest, which latter give vitality to the whole story, are not easy to reconcile. But the scope of the Royal Marine records, covering operations by land and sea in every part of the world, has made General Blumberg's task even more than usually difficult. He has solved it by making his history almost official and exceedingly laconic in construction. He lets the story speak for itself.

The effect on the reviewer was curious. At first it seemed as if he were reading a series of official memoranda, the bare bones of a history and then the amazing story began to have its full effect. The question is often asked, What are the Marines, what do they do, in short, why are the Marines? It sounds like a riddle, and the answer is given in full in these pages; it is almost: What are they not and what do they not do? Soldier-seamen afloat, soldiers in every theatre of war: infantry, artillery, engineers, coast defence gunners of every kind, submarine miners and labour corps. Not all the work, of course, was of the full publicity type, even less than the hard worked, hard fighting regiments of the British infantry of the line could the innumerable detachments of Marines be mentioned in the records of what was happening in the war; but the work went on. Many, very many of them lie in unrecorded graves; in the wastes of Northern Russia, in France and Flanders, in Africa and China, in Mesopotamia and in the waters of all the Seven Seas; they share the last honour with a vast host of their countrymen. Their story is fittingly and simply told in this volume. It is a tale to read and to remember with pride.

The Story of the Household Cavalry. Volume III. By Captain Sir George Arthur, Bart., late 2nd Life Guards, assisted by Captain Sherman, Royal Horse Guards. (William Heineman, Ltd., London). 1926.

This volume of 200 odd pages deals with the Great War in broad outline, mainly with the opening stage of the campaign. The latter part explains the conversion of the mounted regiments into machine gun battalions, a siege battery and other units.

The Royal Fusiliers in an Outline of Military History, 1685-1926.

(Printed by Gale & Polden, Wellington Works, Aldershot.) 1926.

A very brief popular history of the Royal Fusiliers, compiled with a view to being put into the hands of every recruit on enlistment.

The Annals of the King's Royal Rifle Corps.

Vol. III. By Lieutenant-Colonel Lewis Butler. (John Murray, London). 30s.

Volume III of the Annals of the King's Royal Rifle Corps continues the story of the Regiment from 1830 until 1873.

Following on the lines of the first two volumes, Colonel Lewis Butler, in this third one, shows how the regimental principles of a former commanding officer of this historic Regiment were adapted to the more modern times by Colonel R. B. Hawley. The historian's statement in his preface, that the "deficiencies in the Battalion 'Digest of Service' leave much to be required," will be thoroughly agreed to by other Regimental historians.

Chapter I is an exceptionally interesting one, containing much new and useful information about the term colonel commandant and the inception of the regimental records. There are useful appendices, including a summary of regimental events, 1873-1918.

Volume III, like its predecessors, is excellently got up and produced, with good maps and illustrations, and the regiment are to be congratulated on having an author of Colonel Lewis Butler's attainments.

A Brief Record of the Herts Yeomanry and the Herts Artillery. By Major A. L. P. Griffith, D.S.O., R.A. (Printed by Geo. Creasey & Sons, 10, Bull Plain, Hertford). 1927. 2s.

This tightly packed brochure contains an account of all the Yeomanry and Artillery units that have been raised in the County of Hertford during the past two and a half centuries. The matter is treated from the historical and purely county point of view, and forms an interesting departure from the stereotyped regimental history. The epitome of the deeds of the Herts Yeomanry and Artillery in the Great War is useful.

Historical Record of the 6th Gurkha Rifles.

Volume I, 1817-1919. Compiled by: 1st Batt., Major D. G. J. Ryan, D.S.O.; 2nd Batt., Major G. C. Strahan, O.B.E.; 3rd Batt., Capt. J. K. Jones. For private circulation only. With a Foreword by Field-Marshal Sir William Birdwood, Colonel, 6th Gurkha Rifles.

This is a good regimental history of a well-known corps. The 1st Battalion served with distinction at Gallipoli in 1915, and the greater part of the volume is devoted to a detailed study of that fighting. The 2nd Battalion, raised in 1911, was employed in Mesopotamia. The 3rd Battalion, a creation of the war, never left India.

ADDITIONS TO THE LIBRARY

February, March, April, 1927.

- WORK OF THE ROYAL ENGINEERS IN THE EUROPEAN WAR, 1914-19.** Miscellaneous. Compiled by Colonel G. H. Addison, C.M.G., D.S.O., etc. 8vo. (Published by the Secretary, Institution of Royal Engineers.) Chatham, 1927. (Presented by the Institution of Royal Engineers.)
- THE ROYAL ARMY VETERINARY SCHOOL, 1880-1925.** By Colonel A. G. Todd, C.B.E., D.S.O., Deputy-Director of Veterinary Services, Southern Command. (Pamphlet reprinted from "The Veterinary Journal," Vol. 83, No. 1.)
- "HARDLYING"—EASTERN MEDITERRANEAN, 1914-19.** By Captain L. B. Weldon, M.C. 10s. 6d. 8vo. (Published by Herbert Jenkins, Ltd.) London, 1925.
- NOTES ON TRAINING FOR WAR.** By A. Kearsey, D.S.O., O.B.E., p.s.c., late Lieutenant-Colonel, General Staff. 8vo. (Hugh Rees, Ltd.) London, 1926. (Presented by the Publishers.)
- TACTICS.** By P. S. Bond and E. H. Crouch. \$2.75. 8vo. (Published by The New Military Library.) Baltimore, M.D., 1923.
- THE PLATE OF THE WORSHIPFUL COMPANY OF GOLDSMITHS.** By John Bodman Carrington and George Ravensworth Hughes. 8vo. (Printed at the University Press.) Oxford, 1926. (Presented by the Prime Warden and Wardens of the Goldsmiths' Company.)
- TIGER AND OTHER GAME.** The practical experiences of a soldier-shikari in India. By Colonel A. E. Stewart. 16s. 8vo. (Longmans, Green & Co., Ltd.) London, 1927. (Presented by the Publishers.)
- BATTLESHIPS IN ACTION.** By H. W. Wilson. 42s. 2 Vols. 8vo. (Published by Sampson Low.) London, 1926.
- LES ARMÉES FRANÇAISES DANS LA GRANDE GUERRE.** (Published by Ministre de la Guerre.) Paris.
 Tome I. 5 Vols. 3 cases. Maps. 1914. 8vo. £8 8s.
 Tome VII. 3 Vols. 1 case. Maps. 1918. 8vo. £2 15s.
 Tome X. 2 Vols. 8vo. £2 10s.
- RELIEF OF KIMBERLEY—A LIST OF THE OFFICERS PRESENT.** Compiled in 1924. (Presented by Colonel S. L. Barry, C.M.G., C.B.E., D.S.O., M.V.O.)
- KAISER WILHELM II.** By Emil Ludwig. Translated by Ethel Colburn Mayne. 21s. 8vo. (G. P. Putnam.) London, 1926.
- THE SHERWOOD FORESTERS REGIMENTAL ANNUAL, 1926.** Edited by Colonel H. C. Wylly, C.B. 8vo. (Allen & Unwin, Ltd.) London, 1927. (Presented by the Editor.)
- THE WORLD CRISIS, 1916-1918.** By the Rt. Hon. Winston S. Churchill, C.H., M.P. 42s. 8vo. 2 Vols. (Thornton Butterworth, Ltd.) London, 1927.

- THE LIFE OF LIEUTENANT-GENERAL HIS HIGHNESS SIR PRATAP SINGH, G.C.B., G.C.S.I., G.C.V.O., LL.D. By R. B. Van Wart, O.B.E., M.A. 12s. 8vo. (Oxford University Press.) 1926. (Presented by the Publishers.)
- THE BROTHERHOOD OF THE SEA. By E. Keble Chatterton. 12s. 6d. 8vo. (Longmans, Green & Co.) London, 1927. (Presented by the Publishers.)
- EAST CARELIA AND KOLA LAPMARK. By Theodor Homen. 8vo. (Longmans, Green & Co.) London, 1921. (Presented by the Finnish Legation.)
- THE GREAT DELUSION—A STUDY OF AIRCRAFT IN PEACE AND WAR. By Neon. 12s. 6d. 8vo. (Ernest Benn, Ltd.) London, 1927. (Presented by the Publishers.)
- SEAMARKS AND LANDMARKS. By Surgeon-Captain O. W. Andrews, C.B.E., R.N. 18s. 8vo. (Ernest Benn, Ltd.) London, 1927.
- THE STUDY OF WAR—FOR STATESMEN AND CITIZENS. Edited by Sir George Aston, K.C.B. 10s. 6d. 8vo. (Longmans.) London, 1927. (Presented by the Publishers.)
- REVOLT IN THE DESERT. By T. E. Lawrence. 30s. 8vo. (Jonathan Cape.) London, 1927.
- LES FLOTTES DE COMBAT POUR 1927. By Commandant De Balincourt. (Société d'Éditions Géographiques, Maritimes et Coloniales.) Paris, 1927. (Presented by the Publishers.)
- THE AUTO-BIOGRAPHY OF A WOMAN SOLDIER. By Flora Sandes. 10s. 6d. 8vo. (H. F. & G. Witherby.) London, 1927. (Presented by Publishers.)
- LAND, SEA AND AIR. By Admiral Mark Kerr. 21s. 8vo. (Longmans.) London, 1927. (Presented by the Publisher.)
- THE NAVY OF TO-DAY. By Sir George Aston. 3s. 6d. 8vo. (Methuen & Co., Ltd.) London, 1927. (Presented by the Publisher.)
- LAFAYETTE ET ROCHAMBEAU AU PAYS DE WASHINGTON. By Louis de Royaumont. 12s. 6d. 8vo. (J. Rey Grenoble.) 1919.
- THE PAPERS OF THOMAS BOWREY, 1669-1713. Edited by Lieutenant-Colonel Sir Richard Cornac Temple, Bt. 8vo. (The Hakluyt Society.) London, 1927.
- THE YOUNG IDEA, A NAVAL JOURNAL EDITED ON BOARD H.M.S. "CHESAPEAKE" IN 1857, 1858 and 1859. (Presented by Mr. S. Cowles, Cambridge University Museum of Archæology.)
- NOTES AND LECTURES ON THE CAMPAIGN IN MESOPOTAMIA. By Lieutenant-Colonel A. Kearsy, D.S.O., O.B.E. 5s. 8vo. (Hugh Rees.) London, 1927.
- NOTES ON TRAINING FOR WAR AND PROMOTION WITH SCHEMES AND SOLUTIONS. By Lieutenant-Colonel A. Kearsy, D.S.O., O.B.E. 5s. 8vo. (Hugh Rees.) London, 1927.
- OFFICERS OF THE BENGAL ARMY, 1758-1834. Part I. By Major V. C. P. Hodson. 18s. 8vo. (Constable.) London, 1927.
- BASIC PRINCIPLES OF AIR WARFARE (THE INFLUENCE OF AIR POWER ON SEA AND LAND STRATEGY). By "Squadron-Leader." 7s. 6d. 8vo. (Gale & Polden, Ltd.) Aldershot, 1927. (Presented by the Publishers.)
- VADE-MECUM FOR FIELD GENERAL COURTS-MARTIAL. By Major O. M. T. Frost. 1s. 6d. 8vo. (Gale & Polden.) Aldershot, 1927. (Presented by the Publishers.)

- GORDON HIGHLANDERS' MUSTER ROLL AT THE PERIOD OF WATERLOO. By J. M. Bulloch. (Pamphlet privately printed, 1927.) (Presented by the Author.)
- AUSTRALIA, WHITE OR YELLOW? By Fleetwood Chidell. 8s. 6d. 8vo. (W. Heinemann, Ltd.) London, 1927.
- LE BANDIERE DELL' ARTIGLIERIA DAL 1739 AL 1926. By Colonnello L. R. Machiavelli. 8vo. Rome, 1926. (Presented by the Publishers.)
- IMPERIAL WAR MUSEUM PHOTOGRAPHIC RECORDS OF THE GREAT WAR, 1914-18 (ARMY) No. 1. 6d. Booklet. (Published by authority of the Trustees.) (Presented by the Trustees.)
- BOLSHEVIST RUSSIA. By Anton Karlgren. 12s. 6d. 8vo. (George Allen & Unwin, Ltd.) London, 1926.
- AIR FACTS AND PROBLEMS. By Brigadier-General Lord Thomson, C.B.E., D.S.O. 6s. 8vo. (John Murray.) London, 1927.
- THE PERILOUS ADVENTURES AND VICISSITUDES OF A NAVAL OFFICER, 1801-1812. Memoirs of Admiral George Vernon Jackson, edited by Harold Burrows, C.B.E., F.R.C.S. 15s. 8vo. (W. Blackwood & Sons.) Edinburgh, 1927.
- WHERE FREEDOM FALTERS. By the author of the "Pomp of Power." 16s. 8vo. (Charles Scribner's Sons.) London, 1927.
- NIVELLE ET PAINLEVÉ, LA DEUXIÈME CRISE DU COMMANDEMENT. By Mermeix. 12 fr. 8vo. (Ollendorff.) Paris, 1920.
- SURRENDERED—SOME NAVAL WAR SECRETS. By Griff. 8vo. (Sampson Low.) London, 1926. (Presented by Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O.)
- THE CANADIANS IN FRANCE, 1915-1918. By Captain Harwood Steele. 21s. 8vo. (T. Fisher Unwin.) London, 1919.
- TACTICAL SCHEMES FROM PLATOONS TO BRIGADES, WITH SOLUTIONS AND NOTES. By A. Kearsey, D.S.O., O.B.E., late Lieutenant-Colonel, General Staff. 7s. 6d. 8vo. (Gale & Polden.) Aldershot, 1927. (Presented by the Publishers.)
- THE DEFENCE OF PIEDMONT, 1742-1748—A PRELUDE TO THE STUDY OF NAPOLEON. By Spenser Wilkinson. 21s. 8vo. (Clarendon Press.) Oxford, 1927. (Presented by the Publishers.)
- OUR FAR EASTERN ASSIGNMENT. By Felix Morley. 3s. 6d. 8vo. (Student Christian Movement.) London, 1926.

DIVISIONAL HISTORIES.

- THE EIGHTH DIVISION IN WAR, 1914-1918. By Lieutenant-Colonel Boraston and Captain C. E. O. Bax. 6s. 6d. 8vo. (Published by the Medici Society.) London, 1926.
- THE SEVENTH DIVISION, 1914-1918. By C. T. Atkinson. 16s. 8vo. (Published by John Murray.) London, 1927. (Presented by the 7th Division Memorials Committee.)

REGIMENTAL HISTORIES

BRITAIN'S SEA SOLDIERS. A HISTORY OF THE ROYAL MARINES, 1914-1919. By General Sir H. E. Blumberg, K.C.B., Royal Marines. 8vo. (Swiss & Co.) Devonport, 1927. (Presented by the Author.)

THE STORY OF THE HOUSEHOLD CAVALRY. Vol. III. By Captain Sir George Arthur, Bt., assisted by Captain Shennan, Royal Horse Guards. 35s. 8vo. (William Heinemann, Ltd.) 1926. (Presented by John Dennis, Esq.)

THE ROYAL FUSILIERS IN AN OUTLINE OF MILITARY HISTORY BY A FUSILIER. 8vo. (Gale & Polden, Ltd.) Aldershot, 1926. (Presented by the Publishers.)

HISTORICAL RECORD OF THE 6TH GURKHA RIFLES, 1817-1919. Edited by Major D. G. J. Ryan, D.S.O. 8vo. (Gale & Polden.) 1927. (Presented by the Officers, 6th Gurkha Rifles.)

A BRIEF RECORD OF THE HERTS YEOMANRY AND THE HERTS ARTILLERY. By Major A. L. P. Griffith, D.S.O., R.A. 2s. 8vo. (Creasby & Sons,) Hertford, 1927. (Presented by the Author.)

DIVISIONAL HISTORIES.

THE KENT DIVISION IN WAR. By Major-General Sir John Dill, G.C.B., and Captain R. O. Bell, D.S.O. (Presented by the Kent Division.) London, 1918.

THE SEVENTH DIVISION 1914-1918. By Major-General Sir John Dill, G.C.B., and Captain R. O. Bell, D.S.O. (Presented by the Division.) London, 1918.

Report of Proceedings

at the

Ninety-sixth Anniversary Meeting

Held on Tuesday, 1st March, 1927, at 3.30 p.m.

General The Right Hon. The LORD HORNE, G.C.B., K.C.M.G. (*Chairman of the Council*), presiding.

THE CHAIRMAN: I will ask the Secretary to read the Notice convening the Meeting.

THE SECRETARY (Lieut.-Colonel Sir Arthur Leetham, K.C.V.O., C.M.G.) read the Notice.

ANNUAL REPORT FOR 1926.

The Council have the honour to present their annual report for the past year.

COUNCIL.

Captain The Viscount Curzon, C.B.E., V.D., R.N.V.R., A.D.C. to H.M. The King, M.P., was elected a Member of the Council vice Captain The Viscount Tredegar, C.B.E., R.N.V.R., resigned (under Chapter IV, paragraph 9 of the Bye Laws).

Major-General A. R. Cameron, C.B., C.M.G., Director of Staff Duties, has been appointed a Member of the Council as the official War Office representative, vice Major-General Sir J. T. Burnett-Stuart, K.B.E., C.B., C.M.G., D.S.O.

The following Members of the Council, having completed three years' service, retire :—

Admiral Sir H. H. Bruce, K.C.B., M.V.O.
 General Sir P. W. Chetwode, Bart., K.C.B., K.C.M.G., D.S.O.
 Lieut.-General H. D. Farquharson, C.M.G.
 Colonel The Lord Ampthill, G.C.S.I., G.C.I.E.
 Brig.-General The Earl of Lucan, K.B.E., C.B., T.D., A.D.C.
 Colonel The Duke of Northumberland, K.G., C.B.E., M.V.O.
 Colonel C. W. Trotter, C.B., T.D.,

all of whom offer themselves for re-election, having been duly nominated.

STAFF.

The Council regret to have to report that Lieut.-Colonel Sir Arthur Leetham, Knt., K.C.V.O., C.M.G., has decided to retire from being the Secretary, Curator and Chief Executive Officer during the coming year, but they are pleased to state that he will continue in the office of Curator of the Museum (Honorary) until such time as a member of the Staff is in the position to relieve him. Steps are being taken to fill the vacancy.

Major H. G. Parkyn, O.B.E., will terminate his appointment as Librarian on March 1st, having been appointed to a similar post at the Staff College. Major E. L. Hughes, D.S.O., O.B.E., late Northamptonshire Regiment, has been appointed to succeed him.

MEMBERSHIP.

The Council beg to report that during the past year 319 officers joined the Institution (against 355 in 1925). There were 253 withdrawals and 95 deaths, making a decrease on the year of 29. The number of withdrawals are to be accounted for by the small voluntary increase in the Annual Subscription (4 shillings) not being accepted.

The total number of Members on the 31st December, 1926, was 5,898.

The details of Members joining are as follows :—

Regular Army (all arms)	...	...	...	...	225
Royal Navy	...	...	...	...	34
Royal Air Force	...	...	...	...	32
Territorial Army	...	...	...	...	10
Royal Marines	...	...	...	...	8
Royal Naval Reserve and Volunteer Reserve	...	...	...	...	4
Overseas Forces	...	...	...	...	4
Civil Functionaries	...	...	...	...	2
					<hr/>
					319

A very gratifying feature is the support which has been received from serving officers of the Indian Army.

FINANCE.

It will be seen by the Annual Accounts that the year's working has given a balance debit of £757, against £2,104 in the previous year.

The Finance Committee hope that the small increase to the annual subscription will enable the accounts to balance at the end of this present year.

The heating apparatus in the Institution's building is showing considerable signs of wear, and will require rather extensive repairs in the summer, but steps will be taken to curtail, as far as possible, this extra expenditure.

The invested funds amount to £15,026, which is the market valuation of such investments in the Stock Exchange Official Price List, December 31st, 1926, being a depreciation of the sum of £1,838.

LIBRARY.

The number of books added to the Library during the past year was 340, which included gifts by Captain A. S. H. Douglas, O.B.E., Rifle Brigade, Major-General Sandbach, C.B., D.S.O., and a bequest by the late Major Sir Duncan Campbell, Bart., M.V.O. Two valuable accessions have been made to the Manuscript Collection of the Library, viz.: the papers of the late General Sir W. J. Codrington, G.C.B., during the period he was Commander-in-Chief of the British Army in the Crimea, given by General Sir A. E. Codrington, K.C.B., K.C.V.O., and which, together with those presented by Colonel Lord Raglan, form an unique collection of papers dealing with the Crimea. The Hon. Sir John Fortescue, K.C.V.O., has presented a large number of the notebooks which he used in compiling his "History of the British Army," these contain a vast amount of information and will prove of the very greatest interest and value to students of military history.

The clearance of out-of-date works has been continued.

The number of books in the Library is now 26,320, and maps 7,415.

The number of books issued to Members during the past year has decreased, owing, no doubt partly to the industrial trouble which took place at the commencement of the year, which prevented many serving officers making use of the Library, and partly that a large number of former subscribers to the Lending Library were waiting until the new regulations governing the issue of books came into force on the 1st January, 1927, to make use of the Library, the decrease may therefore be considered a temporary fluctuation.

THE JOURNAL.

POLICY.—The policy approved by the Council, as published in the JOURNAL of February, 1926, has been steadily developed, and efforts have been directed towards making it increasingly interesting and instructive to all three Services. In this connection it is satisfactory to note that very many of the articles published during the past year were written by officers of the standing of Major and Captain in the Army or equivalent ranks in the Navy and Air Force, and that the greater proportion of our contributors have been

officers on the Active Lists, who are necessarily in close touch with current Service topics and opinions. This desirable state of affairs has come about, very largely, through the good relations which now exist between the staff of the Royal United Service Institution and the Naval, General and Air Staffs.

A close liaison has also been established with the Naval War College and Naval Staff College at Greenwich and the Flag and other officers of those establishments have afforded their active support and assistance to the JOURNAL and in the matter of naval lectures.

Distance, perhaps, accounts for there being less personal association with the Army and R.A.F. Staff Colleges, but contributions are not lacking from students and "p.s.c." officers of the former.

The Editor will welcome articles or lectures duly approved and suitable for general reading from the R.A.F. Staff College.

INTERNATIONAL AFFAIRS.—A new feature in the JOURNAL is the section devoted to the "International Situation." Articles of this nature have been contributed from time to time, but in the more recent numbers a serious endeavour has been made to pass in review current international affairs.

It is not the intention to devote space to purely political topics, but rather to widen the scope of reading matter so as to include those aspects of the International Situation which may bear on the balance of power, Imperial Defence, the strength of our own fighting forces and those of foreign nations and which, in the event of war, might influence both policy and strategy.

It is hoped that Members of the Institution serving abroad will contribute increasingly to this section of the JOURNAL.

CORRESPONDENCE.—Experience shows that the Correspondence pages are becoming increasingly popular. They provide scope for the elaboration of important subjects dealt with in Lectures and articles and for the interchange of Members' views.

GENERAL SERVICE NOTES.—The inauguration of the Imperial Defence College and the greatly increased attention paid to co-operation between the Services has inspired Notes dealing with subjects of common interest to all three Services and it is intended that these shall be a regular feature in future.

The average number of pages of reading matter has been increased.

ACKNOWLEDGMENT TO CONTRIBUTORS.—The thanks of the Institution are due to the various lecturers and writers who have contributed to the JOURNAL throughout the year.

MUSEUM.

During the year 1926 there have been added eighteen new exhibits, which have been placed on exhibition in the building, and a large number of offers of gifts have had to be declined owing to lack of space to exhibit or store them. The Council desire to express their thanks to the various donors of these additions, which include a large Oil Painting by T. Luny, representing the British Fleet under Lord Howe escorting into Spithead the French Men-of-War captured on the glorious first of June, 1794, presented by Mr. Walter M. de Zoete; a marble Bust of the late Field-Marshal The

Earl Kitchener, executed by the late Sir William Thornycroft, R.A., and given by Lady Thornycroft; a large oil painting, executed in 1817, of Field-Marshal the Duke of Wellington, presented by Colonel W. Evans, H.A.C.; a Sword which belonged to Vice-Admiral Edward Vernon (1684-1757), bequeathed by the late J. C. Vernon-Taylor, Esq.

The total number of persons to pass through the turnstiles amounted to 29,457, against 28,472 in 1925, but this does not include the very considerable number of visitors introduced by Members personally. A very large number of Soldiers, Sailors, Airmen and Boy Scouts were also granted free admission.

The total amount taken at the turnstiles was £1,127 18s. 6d., against £1,064 17s. 9d. in 1925, being a small increase.

Forty-two schools were granted free admission to the Museum during the year, and attendants were specially detailed to conduct these parties and explain the various exhibits.

The amount standing to the credit of the Museum Purchase Fund is £31 5s. 8d., and the Museum Committee trust that this fund will continue to receive support from Members, especially those interested in the Museum.

ARTHUR LEETHAM, Lieut.-Colonel,

Secretary, Curator and

Chief Executive Officer.

February 1st, 1927.

DR.

BALANCE SHEET, 31ST DECEMBER, 1926.

CR.

vi.

NINETY-SIXTH ANNIVERSARY MEETING

	£	s.	d.	£	s.	d.
To Excess of Assets over Liabilities as at 31st December, 1925	93,380	8	1			23,101 16 8
" Additions Museum Exhibits, etc. catalogued during the year	51	0	0			
" Appreciation of Investments to Market Price as at 31st December, 1926	136	4	10			10,811 8 0
Less Loss on Realisation of Investments	38	7	6			1 16 0
				10,813	4	0
Less Amount written off on re-valuation for insurance purposes				684	4	0
	93,539	5	5			10,129 0 0
Less Amounts written off on re-valuation for insurance purposes:—						
Furniture, Fixtures, Fittings, Books, Maps, Charts etc.	684	4	0			
Museum Exhibits etc.	5,794	1	0			46,767 4 6
Revenue Account—						111 0 0
Deficit for the year	756	19	5			46,878 4 6
				5,794	1	0
						41,084 3 6
" Sundry Creditors						
" Museum Purchase Fund						1,719 11 5
" Leasehold Redemption Fund						1,008 15 0
						5,723 6 7
						3,561 15 1
						12,013 8 1
" Leasehold Redemption Fund—Investment Account at Market Price 31st December, 1926—						
£2,421 18s. 8d. India 3½% Stock						1,575 16 3
£1,000 5% War Loan, 1929-47						
£6,693 19s. 4% Funding Loan, 1960-90						
£4,701 19s. 9d. 3½% Conversion Loan						1,436 19 9
" Leasehold Redemption Fund—Investment Account at Market Price 31st December, 1926—						
£1,945 9s. Ceylon 3% Stock						
£2,317 4s. 5d. London County Council 3% Stock						
" Sundry Debtors and Amounts paid in Advances						3,012 16 0
" Cash at Bank and in Hand						645 6 0
						328 0 7
						£90,314 10 10

We have examined the above Balance Sheet with the Books and Vouchers and certify the same to be correct.

All our requirements as Auditors have been complied with. We have verified the Cash Balances and Investments set out in the Balance Sheet, and, subject to the Leasehold Redemption Fund being sufficient to provide for the depreciation of the Lease, we are of opinion that the Balance Sheet is properly drawn up and correctly shows the position of the Royal United Service Institution on 31st December, 1926.

61½, Fore Street, London, E.C.2, 2nd February, 1927.
WILDE, FERGUSON-DAVIE, AND MILLER, Chartered Accountants, Auditors.

DR. REVENUE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1926. CR.

1925.	£	s.	d.	£	s.	d.	1925.	£	s.	d.
1,702 10 0 To Salaries ..	1,847	10	0	4,202	18	0 By Members' Subscriptions ..	4,337	7	6	
2,021 17 9 " Wages and National Insurance ..	1,932	9	9	48	14	0 " Extra Subscriptions ..	43	17	6	
163 18 0 " Attendants' Clothing ..	179	0	0	323	15	0 " Life Subscriptions ..	389	11	0	
26 0 0 " Pensions and Gratuities ..	31	0	0	322	7	0 " Entrance Fees ..	380	2	0	
295 8 10 " Museum Sundries ..	4,049	19	9	1,064	17	9 " Admissions to Museum ..	1,127	18	6	5,150 18 0
1,808 7 7 " Purchase of Museum Pamphlets ..	42	18	7	108	3	1 " Sale of Museum Catalogues and Pamphlets ..	104	8	5	1,232 6 11
330 19 9 " JOURNAL Printing ..	1,661	10	4	475	10	5 " Sale of JOURNAL ..	474	3	3	
284 15 6 " JOURNAL Postage ..	325	6	4	222	1	7 " Advertisements in JOURNAL ..	257	0	6	
168 2 6 " Literary Services ..	285	18	4	191	14	3 " Lending Library ..	731	3	9	
69 6 5 " Library, Purchases and Binding of Books ..	128	17	0	20	6	7 " Repairing of Regimental Colours ..	142	8	6	
87 5 0 " Periodicals and Newspapers ..	57	6	4	7	2	0 " Miscellaneous Receipts ..	10	1	9	15 14 9
41 7 4 " Advertising ..	86	4	6	130	10	0 " Rent of Lecture Theatre, etc. ..	542	1	8	142 19 0
15 5 4 " Shortland Notes ..	46	7	10	640	9	0 " Dividends and Interest ..	122	16	10	664 18 6
15 5 4 " Lecture Expenses ..	2	10	0	129	4	10 " Refund of Income Tax thereon—1925-26 ..	750	0	0	750 0 0
580 0 0 " Ground Rent ..	580	0	0	750	0	0 " Government Grant ..	2,104	16	7	756 19 5
854 2 5 " Water Rate ..	58	19	8	2,104	16	7 " Balance, being Deficit for the year ..				
87 19 5 " Insurance ..	68	8	11							
166 11 8 " Fuel ..	185	9	1							
150 14 4 " Lighting ..	138	12	11							
105 5 5 " Repairs ..	326	10	2							
886 0 0 " Renewal of Museum Heating Apparatus ..	393	18	2							
316 0 6 " House Expenses and Sundries ..	974	10	4							
42 0 0 " Audit and Accountancy ..	42	0	0							
79 11 10 " Postages, Telegrams, etc. ..	92	16	1							
259 10 3 " Printing and Stationery ..	198	10	9							
19 11 9 " Telephone ..	35	10	9							
13 13 0 " Gold Medal ..	326	17	7							
11 4 7 " Interest on Bank Overdraft ..	13	15	6							
	12	18	5							
£10,740 10 1	£9,587 8 10			£10,740 10 1	£9,587 8 10					

NINETY-SIXTH ANNIVERSARY MEETING

VII.

CHESNEY MEMORIAL MEDAL FUND.

31st DECEMBER, 1926.

CR.

DR.

	£	s.	d.		£	s.	d.
1926.				1926.			
Jan. 1 To Balance—brought forward	46	14	1	July 19 By Administration Fee—Royal United Service Institution	0	0	2
June 7 " Dividend on £280 Bengal & North Western Railway	3	11	9	Dec. 31 " Balance in favour of Fund	54	6	11
July 7 " Refund of Income Tax on Dividends, 1925-26	0	18	2				
Dec. 6 " Dividend on £280 Bengal & North Western Railway	3	12	1				
3½% Preference Stock							
	£54	16	1				

614, Fore Street, London, E.C.2.
2nd February, 1927.

We hereby certify the above Account to be correct.
WILDE, FERGUSON-DAVIE, AND MILLER, Chartered Accountants,
Auditors.

TRENCH GASCOIGNE PRIZE FUND.

31st DECEMBER, 1926.

CR.

DR.

	£	s.	d.		£	s.	d.
1926.				1926.			
Jan. 1 To Balance—brought forward	31	17	10	Apr. 13 By 1st Prize Essay, 1925	31	10	0
" Dividend on £1,862 London & North Eastern Railway	22	6	10	Mar. 8 " 2nd Prize Essay, 1925	21	0	0
June 1 " 3% Debenture Stock							
Dividend on £100 5% War Loan, 1929-47, Inscribed	2	10	0	July 9 " Administration Fee—Royal United Service Institution	3	13	1
July 1 " Dividend on £1,862 London & North Eastern Railway	22	6	10	Dec. 31 " Balance in favour of Fund	36	18	10
July 7 " Refund of Income Tax on Dividends, 1925-26	11	10	5				
Dec. 1 " Dividend on £100 5% War Loan, 1929-47, Inscribed	2	10	0				
Stock							
	£93	1	11				

614, Fore Street, London, E.C.2.
2nd February, 1927.

We hereby certify the above Account to be correct.
WILDE, FERGUSON-DAVIE, AND MILLER, Chartered Accountants,
Auditors.

BRACKENBURY MEMORIAL FUND.

31st DECEMBER, 1926.

DR.

	£	s.	d.		£	s.	d.
1926.				1926.			
June 1 To Dividend on £421 1s. 5% War Loan, 1925-47, Inscribed Stock	10	10	0	Jan. 1 By Balance brought forward	9	10	8
Dec. 1 " Dividend on £421 1s. 5% War Loan, 1925-47, Inscribed Stock	10	10	0	July 9 " Administration Fee—Royal United Service Institution	1	5	3
				Nov. 6 " Gale & Polden, Ltd.—Books	2	14	6
				Dec. 31 " Balance in favour of Fund	7	10	7
					£21	1	0

We hereby certify the above Account to be correct.

WILDE, FAIRGROVE-DAVIS, AND MILLER, Chartered Accountants, Auditors.

611, Fore Street, London, E.C.2.
2nd February, 1927.

THE CHAIRMAN: Gentlemen, the Annual Report of the Council is in your hands and, with your permission, I will take it as read. The item of this Report of outstanding importance is the retirement of Sir Arthur Leetham after twenty-four years' service as Secretary, Curator and Chief Executive Officer. During this long period of office Sir Arthur Leetham has served the Royal United Service Institution with great ability and with complete devotion. (Hear, hear.) From a long list of improvements, economies and reforms which he has carried through, I may quote the following: (1) Entire re-organization of the Museum and Library, with up-to-date catalogues, and adequate insurance on an economical basis; (2) Re-adjustment of Income Tax and Rating, which has resulted in large savings to the funds of the Institution; (3) Re-arrangement of the system of accounting on business lines. The Council have received the resignation of Sir Arthur Leetham with very great regret, and it has been placed on record in the minutes of their proceedings, together with an expression of their high appreciation of the services which he has rendered during the past twenty-four years.

You will note, however, with satisfaction that, although we lose Sir Arthur Leetham as Secretary, we are not entirely deprived of his services. He remains for a time as Honorary Curator of the Museum, where his unequalled knowledge and experience will be of the greatest value to this Institution. (Hear, hear.)

As regards a successor, the Council have appointed Captain E. Altham, C.B., R.N., the Editor of the JOURNAL, who will combine the duties of Secretary and Chief Executive Officer with those he already performs. This arrangement will result in some economy, which at the present time is very desirable, and it will be on trial for one year, and the Council trust that no loss of efficiency will result.

Our staff suffers a further loss in Major Parkyn, the Librarian, to which reference will be made by the Chairman of the Library Committee. Major Parkyn will be missed both by the Council and by a large circle of friends amongst our members. (Hear, hear.)

The membership has slightly decreased, but the Council trust that this is only temporary. They invite members to bring to notice the many advantages of this Institution, with a view to increasing the flow of new members. I have now, I think, touched upon the salient points of the Report. Finance, Library, the JOURNAL and the Museum will be dealt with by the Chairmen of those Committees.

I have much pleasure in moving: "That the Report and Accounts, as circulated, be taken as read and adopted."

FINANCE.

COLONEL C. W. TROTTER, C.B., T.D. (Chairman of the Finance Committee): My Lords and Gentlemen, with regard to the Accounts, you will see that the Auditor's Certificate is not what is commonly called quite a clean one, as they draw attention to the Leasehold Redemption Fund being insufficient to provide for the depreciation of the lease. The lease of this Institution has forty-five years to run, and it stands in the books at £22,000. The Leasehold Redemption Fund stands at £3,012 16s., but the Council have always considered very carefully this question and they are of opinion that that sum is quite sufficient for the liability involved.

The finance of the Institution is not in a very happy condition, the debit balance for the year being £756 19s. 5d. We are rather disappointed that more new members have not joined the Institution and that our income, therefore, is not larger this year than it was last year. You will, I am sure, agree with me that it is very necessary that our expenditure should not exceed our income. The entrance fee and subscription were raised last year, but we have not yet felt the benefit of that to any great extent, in fact we have rather felt the disadvantage of it, because a considerable number of members resigned and there were a number of deaths, making a decrease in the membership on the year of twenty-nine. We hope that this decrease will only be temporary. In the meantime we are taking steps to bring about every economy possible and to reduce the expenditure without lessening the efficiency of the Institution. I do not think there is anything to be alarmed at, but we cannot continue every year to sell capital to pay the deficit on the working of the year. I hope that next year the Finance Committee will be able to report that the income and the expenditure balance.

LIBRARY AND JOURNAL.

ADMIRAL SIR REGINALD TUPPER, G.B.E., K.C.B., C.V.O. (Chairman of the Library and Journal Committee): My Lords and Gentlemen. It is my pleasure to bring before you a few points with regard to the Library and the JOURNAL. First of all, taking the Library, we must all very greatly regret that Major Parkyn has left us for what is considered a better billet, namely, the Librarianship at the Staff College. We have been fortunate enough to obtain the services of Major Hughes, late of the Northamptonshire Regiment; he has been working in the Library for the past three or four months, and I hear on all sides that he is likely to be a very worthy successor to Major Parkyn. The Library continues to be very useful to a great many officers. The books which are considered as being of no particular value are gradually being got rid of, and, of course, we are continuously adding other books to the Library. Most of the books that are published dealing with naval and military subjects are given to us, but great care has been exercised in regard to the purchase of other books so that we get the books that are most likely to be required by the members.

As regards the JOURNAL, I hope the members of the Institution will agree that its appearance, its tone, and the articles generally are useful and interesting, and I know from personal knowledge that it is highly appreciated. Amongst other improvements the Editor has made are the pictures for the frontispieces; some of these, like that of Drake's "Golden Hinde," are well worth keeping and framing. With regard to the remarks that have been made by my colleague, Colonel Trotter, I can assure you that every effort will be made to keep down the expenses connected with the JOURNAL in the coming year. You will notice the statement made in the Annual Report that we received during the past year more contributions from junior officers than has been the case hitherto. The Council of the Institution and the Journal Committee particularly wish to encourage young officers to send in contributions to the JOURNAL, as it is most necessary to get the opinion of the rising generation on various matters connected with all three Services. I shall be very glad to hear any remarks that any member of the audience wishes to offer with regard to improvements in the JOURNAL. With those few remarks I beg to support the resolution.

MUSEUM.

COLONEL C. H. COLVIN, C.B., D.S.O. (Chairman of the Museum Committee): My Lords and Gentlemen. During the year 1926, eighteen new exhibits have been added to the Museum. The Council desire to express their thanks to the various donors. The gifts include a large oil painting by T. Luny of the British Fleet under Lord Howe escorting into Spithead the French Men of War captured on the glorious 1st of June, 1794, presented by Mr. Walter de Zoete; a marble bust of the late F.M. Earl Kitchener, executed by the late Sir William Thornycroft, R.A., presented by Lady Thornycroft; a large oil painting, dated 1817, of F.M. The Duke of Wellington, presented by Colonel W. Evans, H.A.C.; and a Sword which belonged to Admiral Edward Vernon (1684-1757) bequeathed by the late Mr. J. C. Vernon Taylor. A large number of offers of gifts have had to be declined for want of space or storage. The number of persons passing through the turnstiles totalled 29,457 against 28,472 in 1925; these numbers do not include visitors introduced by members personally, and a large number of soldiers, sailors, airmen and boy scouts, besides forty-two schools, granted free admission, and for which attendants were specially detailed to conduct and explain the various exhibits. The amount taken in cash was £1,127 18s. 6d., against £1,064 17s. 9d., being about £60 increase. The amount standing to the credit of the Museum Purchase Fund is £31 5s. 8d., and the Museum Committee trust that this fund will continue to receive support from members and those interested in the Museum. As Chairman of the Museum Committee, I should like to say that it is a great satisfaction to know that Sir Arthur Leatham will continue in the office of Curator for the present, as his knowledge of antiques, armoury and pictures, and the art of showing them effectively is a gift possessed by few, and the result of his work has materially added to the attractiveness of the Museum. (Cheers.)

THE CHAIRMAN: I will now put the motion to the meeting: "That the Report and Accounts, as circulated, be taken as read and adopted."

The resolution was then put and carried unanimously.

THE AUDITORS.

MAJOR A. C. CHAMIER proposed that "The thanks of the meeting be accorded to the Auditors, Messrs. Wilde, Ferguson, Davie and Miller, for their services, and that they be re-elected Auditors for the ensuing year at a fee of forty guineas." Colonel H. Wylly, C.B., seconded the resolution, which was carried unanimously.

VACANCIES ON THE COUNCIL.

THE CHAIRMAN: The following officers have been nominated as candidates for the vacancies on the Council:

ROYAL NAVY (1 Vacancy).

Admiral Sir H. H. Bruce, K.C.B., M.V.O.

REGULAR ARMY (1 Vacancy).

General Sir P. W. Chetwode, Bart., K.C.B., K.C.M.G., D.S.O.

ROYAL MARINES (1 Vacancy).

Lieut.-General H. D. Farquharson, C.M.G.

MILITIA (1 Vacancy).

Colonel The Lord Ampthill, G.C.S.I., G.C.I.E.

TERRITORIAL ARMY (3 Vacancies).

Brigadier-General The Earl of Lucan, K.B.E., C.B., T.D., A.D.C.

Colonel The Duke of Northumberland, K.G., C.B.E., M.V.O.

Colonel C. W. Trotter, C.B., T.D.

No other candidates having come forward, with your approval I announce that the officers whose names I have read have been re-elected Members of the Council.

THE GOLD MEDAL ESSAYS, 1926.

THE CHAIRMAN: I will ask the Secretary to report the result of the Gold Medal Essays for 1926.

THE SECRETARY: The following is the Report of the Referees on the Essays sent in for the Gold Medal of 1926:—

"We have the honour to report for the information of the Council of the Royal United Service Institution that, in adjudicating on the six Essays submitted, we have placed the three best in the following order:

(1) No. 4. "*Tendit ad astra fides.*"

(2) No. 2. "There is many a true word spoken in jest."

(3) No. 6. "*Omnia mutantur nos et mutamur in illis.*"

Further, we consider that the Essay placed first is not of a sufficiently high standard to merit the award of the Gold Medal of the Institution. But we recommend that the Trench Gascoigne prizes of thirty guineas and twenty guineas should be awarded to the writers of No. 4 and No. 2 respectively.

(Signed) C. W. GWYNN, Major-General.

GEOFFREY BLAKE, Captain, R.N.

E. R. LUDLOW-HEWITT, Air Commodore.

Royal United Service Institution.

29th January, 1927."

Envelopes No. 4, No. 2 and No. 6 were then opened by the Secretary, and he announced that the Essay No. 4 with the title "*Tendit ad astra fides*" was written by Lieut.-Colonel J. C. Dundas, D.S.O., Royal Tank Corps; the Essay No. 2 with the title "There is many a true word spoken in jest" was written by Wing-Commander C. H. K. Edmonds, D.S.O., O.B.E., Royal Air Force; and Essay No. 6 with the title "*Omnia mutantur nos et mutamur in illis*" was written by Flight Lieutenant A. S. G. Lee, Royal Air Force.

GENERAL SIR J. A. L. HALDANE, G.C.M.G., K.C.B., D.S.O., proposed that the thanks of the Institution be accorded to Major-General C. W. Gwynn, C.B., C.M.G., D.S.O.; Captain G. Blake, D.S.O., R.N., and Air Commodore E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C., for adjudicating on the Prize

Essays, and added:—"I understand that only six Essays were submitted during the past year, which is considerably below the average number. Nevertheless the work of the Referees is a tedious and a difficult one. I therefore have much pleasure in moving this resolution."

VICE-ADMIRAL SIR H. W. RICHMOND, K.C.B., seconded the resolution which was carried unanimously.

THE CHAIRMAN.

ADMIRAL SIR H. H. BRUCE, K.C.B., M.V.O.: Gentlemen, I ask you to join cordially with me in passing the following resolution:—

"That the thanks of the Institution be accorded to the Chairman for presiding at this meeting."

Not only has he presided over the meeting this afternoon, but he has been Chairman of the Council of the Institution for the past two years, and all the members of the Council know what he has done for us and how he has kept up the high traditions of the Royal United Service Institution. I therefore have much pleasure in moving the resolution.

FIELD-MARSHAL THE VISCOUNT ALLENBY, G.C.B., G.C.M.G.: I have the honour and pleasure of seconding this resolution.

The resolution was put to the meeting by Admiral Sir H. H. Bruce, and carried with acclamation.

THE CHAIRMAN: Admiral Bruce, Lord Allenby, My Lords and Gentlemen. Thank you very much indeed. I assure you that I very greatly appreciate your kind words. I know my own shortcomings. Unfortunately, owing to the distance I live away from London, and one thing and another, I have not been able to give as close attention to my duties as I could have wished, but I have been most ably supported by Admiral Bruce as my Vice-Chairman. He has really borne a great deal more of the burden than I have. Thank you very much.

The proceedings then terminated.

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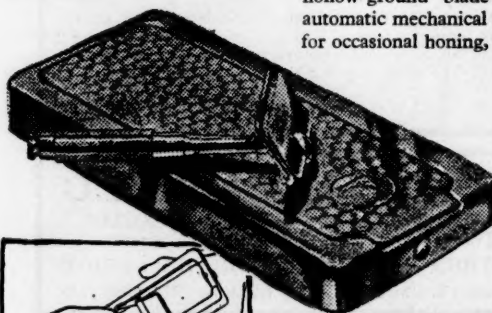
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